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JOHN SYNG DORSEY: THE SECRET OF HIS SUCCESS.

By A. Robin, M. D., Wilmington, Del.

In attempting to write a biography, especially that of a man of eminence, one must first determine its object; is it to record dates of birth, death and similar events of life; is it to draw a pen-portrait of a man that will refresh faded images of one since dead; is it to determine his place in history; or to draw from his life an object lesson for those who survive?

I want to give you a pen-picture of John Syng Dorsey; and wish I had power to restore to its original freshness the faded and almost effaced image of the man who, had he been permitted to live longer, would no doubt have become one of the greatest surgeons of America. Samuel D. Gross has done this and I follow him only because I have recently come into possession of some very interesting papers and other documents kindly turned over to me by his descendant, Mrs. Alfred J. DuPont, née Gardner, and with these before me I want to study his life anew and discover the elements in his life which made for success.

John Syng Dorsey came into the world on December 23, 1783, endowed with the potential faculties which a long line of Quaker ancestry had transmitted. His earliest progenitors, D'Orseys, came from England and settled in Maryland. His father, Leonard Dorsey, was a successful merchant in Philadelphia and a brother-in-law of the famous Dr. Physick.

While in school he distinguished himself by displaying the precocity of genius. His classical education was gained at a Friends' Academy on South Fourth Street. There he displayed unusual abilities, especially in acquiring a knowledge of Latin, English and mathematics and graduated at the age of 15 to begin at once the study of medicine under his illustrious uncle Dr. Philip Syng Physick. The entrance of young Dorsey upon the study of medicine was coincident with the end of the most terrible epidemic of yellow fever which had stricken Philadelphia.

Dr. Physick was just relieved of his arduous duties as voluntary resident at the Bush Hill or City Hospital. He was only 32, and recently married to the highly gifted daughter of a distinguished minister of the Society of Friends, and had just commenced his brilliant course of lectures on surgery at the medical department of the University of Pennsylvania, having thus become the colleague of Rush, Shippen and Wistar. D'Orsey, surrounded by such distinguished men, in daily contact with his brilliant uncle, drinking as it were at the very fountain of medical knowledge, how could he do otherwise than apply himself diligently to the study of medicine! This he did with such industry and proficiency that at the age of 19, two years before the requisite age for graduation, he was given his M. D.

His thesis was upon "The Powers of the Gastric Juice as a Solvent of Urinary Calculi." "His dissertation," says Dr. Chapman, his contemporary and fellow-student, "exhibits some original views, illustrated and maintained by a set of pertinent and well-conducted experiments." Another outbreak of yellow fever occurred in Philadelphia at this time, and young Dr. Dorsey, inspired no doubt by the example of his uncle a few years back, entered the City Hospital as resident physician to take up the fight against this scourge, the danger incurred by thus coming in intimate contact with this dread disease not troubling him. In 1794 Dr. Deveze, who had taken a very prominent part in coping with yellow fever and was regarded as an authority on the subject, advanced the opinion that it was not contagious, a view endorsed by the Academy of Medicine, of which Dr. Physick was then president.

In a communication addressed by that body to the Board of Health the following declaration is made:

Many respectable modern authorities assert that yellow fever is not contagious in the West Indies and repeated observations satisfy us that it is rarely so during the warm weather in the United States. None of the cases we have yet seen have propagated it and we conceive it to be an error as absurd in its nature as it has been fatal in its operation upon the city of Philadelphia that the contagion of a disease should adhere to the timber of a ship during a sea-voyage, and should spread from the timber of the ship without contact through an extensive neighborhood, and cease to communicate itself afterwards by long and close connection of the sick with their families and attendants.

How singular that a hundred years later, after the supposed danger from fomites was accepted as an established fact, the same view should be reaffirmed and the non-contagious nature of yellow fever established on solid experimental ground by our Yellow Fever Commission.

No wonder then that young Dorsey, in the words of his biographer, "showed by his fearless conduct that he was no believer in the contagiousness of that singular, and hitherto unexplained disease. So firm, indeed, was his conviction upon this subject that he frequently exposed himself in the most reckless manner, with a view of courting infection."

While thus in the very midst of the battle he improved every opportunity of studying the disease, and performed numerous autopsies while making careful bedside observations.

It may, indeed, appear extraordinary that a youth not quite 20 should display such independent thought and action in so intricate a field as medicine. This precocity may be explained not alone by his inherent ability, but more especially by the medical training which he had received. His was not a well-planned curriculum with a great deal of theory, polyspecialism and hair-splitting refinement of medical teaching. He began to study and practice the science and art of medicine on entering his uncle's office. No doubt he was made to memorize Cullen's "Practice of Medicine" and other textbooks then in vogue but, judging from the notes in my possession, he was also put to the task of writing up cases which occurred in the practice of his uncle. I have one note-book containing "Notes from Cases of Surgery which have occurred in the Practice of Dr. P. S. Physick, by John Syng Dorsey, 1798-99." Thus reads the title page. The notes are written in a boyish hand but compiled with great care. Some are illustrated. Here is a record of the first case:

July 21, 1798. Visited a patient of the Pennsylvania Hospital of about 30 years of age, John Altery, who informed me that two or three years ago he received an injury on his shin which caused an ulcer to form itself there. The ulcer at first was trifling, but by means of ill-treatment increased to a large size. When I saw it, it was about 7 inches in length and 5 in breadth, and appeared healthy except in one place, where a piece of the tibia as big as a quarter of a dollar was bare and carious. He informed me also that several pieces of the shin bone had come away. The tibia was much enlarged. It was thought that the ulcer had been prevented from healing by the carious bone and that it was impossible for it to heal till all the carious bone should be removed. It was proposed by Dr. Physick and advised by Drs. Shippen, Wistar, and Physick to save the limb by cutting off and dissecting out the diseased part of the tibia, under an idea that new bone would form itself in place of the diseased. The man would not consent to the operation but preferred having the limb cut off, which was accordingly done this day in the following manner: The patient being placed in a convenient situation, a pad of lint was placed over the femoral artery and secured by a bandage over which the torniquet was applied. An incision was then made through the skin and cellular membrane about 4 inches below the knee. The incision was oblique, being 2 inches lower behind than before,—they were then dissected from the muscles so far up as to afford a sufficient flap to cover the extremity of the stump. The muscles were then divided down to the bone, and the interosseous muscles were cut with a catlin. The tibia and fibula were then sawed off and the stump dressed. A bandage was rolled round the femur to the knee over which two slips of adhesive plaster were applied: one reaching from the external condyle of the os femoris under the ham across the stump on the interior side of the tibia to the same of the patella; the other from the internal condyle down the ham over the other slip and across the stump on the internal side of the tibia to the same of the patella, bringing the anterior and posterior flaps in contact. Pledgets of cerate were then applied to the cicatrix, which were covered by a large plaster of ton spread with Ungt. Basil, which were bound round the stump with bandage.

The diction in this report is simple, the composition is likewise that of a schoolboy but withal the description is clear and accurate, presaging the future author of the first important American text-book on surgery. The report of the second case, that of a 4-months-old child afflicted with hydrocephalus, is dated December 25 and contains a very good illustration of the instrument with which Dr. Physick performed the operation. The note-book ends with an index which enumerates the following subjects:

1. Case of amputation in the Pennsylvania Hospital, July 21, 1798.
2. Case of hydrocephalus, December 25, 1798.
3. Case of dissection of an ulcerated cancerous tumor from the eye of a person near 70 years of age.
4. Case of dissection of a thick membrane from the eye.
5. Case of aneurism of the popliteal artery—in the Pennsylvania Hospital.
6. Case of fractured femur.
7. Case of dissection of an encysted tumor from beneath the eye.

8. Case of amputation of thigh.
9. Case of extraction of cataract.
10. Case of operation for the cure of hydrocele.
11. Case of excision of a cancerous underlip.
12. Case of extraction of cataract from each eye of a lady.
13. Case of extraction of cataract.
14. Case of operation for fistula lachrymalis.
15. Case of dissection of tumor from the breast.
16. Case of injury of the head.
17. Case of extraction of cataract.
18. Case of amputation of cancerous mass.
19. Case of operation for radical cure of hydrocele.
20. Case of dissecting off a large cancer from the cheek.
21. Case of amputation of the leg below the knee at Pennsylvania Hospital.
22. Case of polypus.
23. Lithotomy on a child two years old.
24. Varicose veins secured by ligature.
25. Lithotomy on a young man.
26. Trepaning.
27. Hydrocele—cured.
28. Amputation of cancerous mamma and tumor in axilla.
29. Harelip.
30. Tumor from eyelid.
31. Case of divided radial artery secured by ligature.
32. Case of injured head which ended fatally after symptoms of compression. No fracture found.

These cases young Dorsey observed, studied and recorded when only a lad of sixteen. When he entered on his studies at Pennsylvania University he evidently had no time to record cases, for the next record is dated 1801, or one year before graduation. I have reason to believe that he made no records from 1789 to 1801. In a case-book I have we find records of interesting cases compiled at a later date. These records are not dated consecutively, one which occurred in 1802 appearing before one dated 1801, the latter being the earliest date mentioned. Had there been any records prior to this date they would no doubt have been included.

This book reveals in the young student the power of observation and analysis which made Dorsey famous in later years. Thus, in recording a "Case of Fractured Skull, cured by Trephine," October 9, 1801, Dorsey remarks:

This case appears to prove that some portions of the brain are capable of being pressed upon considerably without much influencing the intellectual operations. Daniel (the patient) was not stupid, delirious, nor convulsed from pressure on the brain, but on the 3d day (Oct. 12) the inflammation produced some delirium. In other cases of injured head a trifling pressure on the brain or indeed a fissure without perceptible depression produces coma, convulsions, delirium, vomiting, etc. It further proves the propriety of the depleting plan with a view not merely to relieve but to prevent usual alarming symptoms of compresed brain.

This report is accompanied by a very good illustration of the size and shape of bone removed.

The other reports covering the same period are no less interesting and the remarks no less pertinent, but it would take too long to quote them. I will only quote one more. A very interesting case of hydrophobia in a boy 7 years old which occurred September 15, 1802, is commented upon in the remarks as follows:

Whatever inferences may be drawn from the circumstances of the above case, with respect to the inflammatory nature of the disease it appears to me to prove beyond doubt that it kills by producing spasm of the glottis. To have performed tracheotomy at the late period of the disease when Dr. Physick was called, would not perhaps have been prudent. The patient had then no pulse or scarcely any. His extremities were cold—add to this his age (seven years) was such as would not allow of the instrument necessary to be left in the trachea, to have remained there,—he would certainly have pulled it out and died suffocated. This is not mere opinion for Dr. Shippen relates a case where tracheotomy was performed to relieve cyanosis trachealis and death was produced by the patient pulling out the cannula from the trachea.

That young Dorsey had received recognition a year before graduation is attested by the following certificates: One from the Medical Society of Philadelphia, signed by Benj. Rush, president, showing that Dorsey became a member of that society in 1801. The second, issued by the Chemical Society of Philadelphia, reads:

Desirous of promoting the cultivation of the Science of Chemistry in the United States of America, by associating with themselves persons of distinguished talents, have elected John Syng Dorsey a member of the said Society, hereby granting him all the privileges thereunto belonging.

In 1802, the year of graduation, Dorsey received a certificate from the attending managers and physicians of the Pennsylvania Hospital to the effect that "he hath attended the Practice of the Physicians of the said Hospital for four years." This certificate is signed by Sam'l Coates and Lawrence Seekeb, sitting managers, and Benj. Rush and Philip Syng Physick, attending physicians.

In November, 1803, young Dorsey sailed for Europe with the intention of spending his time in the then two great medical centers—London and Paris. London was familiar ground to Dorsey. There lived and worked John Hunter, and it was in Hunter's private dissecting room that Dorsey's uncle distinguished himself as an apt pupil, having received from his master the very flattering offer of partnership. Moreover, in London, young Dorsey was received by Sir Everard Home, a brother-in-law of Hunter, a fellow-student of Dr. Physick, and at the time of Dorsey's visit, a distinguished surgeon. Upon his arrival Dorsey at once plunged into hard work. He attended lectures, visited hospitals and took courses in anatomy, physiology, pathology, and surgery at William Hunter's Theatre of Anatomy.

A certificate from that institution reads:

These are to certify that John Syng Dorsey, M. D., hath attended our lectures on Anatomy, Physiology, Pathology, and Surgery during one course with great diligence and one course of dissection. Signed: James Wilson and W. Leigh Thomas. Dated, London, May 19, 1804.

The same year he went to Paris where he attended lectures and visited hospitals, devoting apparently but little time to the Latin Quarter and similar attractions, and in October, 1804, returned to Philadelphia and opened an office. For the first few years notwithstanding the help which he received from his uncle, the reputation which he had already acquired

and his affable manner in dealing with his patients Dorsey's practice from a financial standpoint was hardly remunerative. The first year his income was $325.75, the second $924, including $100 which he received from Dr. Physick for spending 10 days in Baltimore with a patient, $50 from a private pupil and $45 from the sale of catheters. The income, however, kept increasing until, in 1817, the year of his untimely death, it amounted to $10,199. Dorsey's annual income, however, was not altogether from practice. His private pupils, of which he had 61, from 1807 to 1817, brought him from $50 to $200 each. For his lectures on surgery and afterwards on materia medica he received $1000 a year, and for his book on surgery $2000. But withal he had what in those days may well be considered a lucrative practice. However, in the early years of waiting, he was not idle, but assisted Dr. Physick in his operations, recorded assiduously that doctor's and his own interesting cases, attended medical meetings and devoted whatever leisure he had to music and poetry. Dorsey was not a poet but he wrote good verse and what is more on deep subjects, for his mind was never frivolous. His first recorded verse was made on a fine summer evening in 1805, when

> With tints far richer than of Tyrian dye,
> The Sun declining paints the Western sky.
> Lost [was] the splendour of his noon-tide blaze,
> Lost the effulgence of his evening rays.

But the man of two and twenty was thinking then of the destiny of man, and plaintively:

> 'Tis so with man;—he rises from the womb,
> Then shines a while, and sinks into the tomb.
> Alas! how few who to their zenith rise,
> And all their course pursue thro' cloudless skies.
> Vapours and mists that rising from the earth
> Obscure the sun receive from him their birth.
> 'Tis so with man, the ills that cloud his brow,
> And all his mis'ries from his follies flow.

Love also urged his pen, for following the above are two lines "written at the urgent request of a lady":

> Two lines I write;—enough to prove
> That writing less than thee I love.

To which his son Robert Rahlston Dorsey irreverently added in 1854:

> And I must make your two lines four
> By wishing you'd loved writing more.

In the same year Dorsey wrote a poem called "Reflections on the Incomprehensibility of God," a very profound and lengthy discourse, also the "Invocation to Oblivion," "Advice to a young Lady," "A valedictory address to my Muse" and a "Song sung at the Anniversary Dinner of the Philadelphia Medical Society" in which he declares:

> With Rush I like bleeding, because I am right sure
> There are fifty diseases the lancet can cure,
> But the tapping a vein I'd with pleasure resign
> For the pleasure of tapping a hogshead of wine.

This was his last verse until in 1815 he again mounted his Pegasus.

In 1807, when only 24, Dr. Dorsey was appointed adjunct professor of surgery at the Pennsylvania University at the request of Dr. Physick, who then occupied the chair. This request came in the form of the following communication:

To the Trustees of the University of Pennsylvania.

GENTLEMEN: In consequence of being afflicted with an infirm state of health and thereby sometimes rendered unable without much suffering to fulfill the duties of my professorship of Surgery with punctuality I am under the necessity of requesting that you would do me the favor of appointing my nephew Dr. John Syng Dorsey to assist me in the Capacity of a Colleague or Adjunct Professor—In favor of his qualifications for that Station I shall only add (without saying anything of his talents) that he has been my assistant in the Surgical part of my business for nearly ten years and that I have the fullest confidence in deriving all that assistance from him which my bad state of health and frequent indisposition require.

Dr. Dorsey does not expect to attend the meetings of the Medical faculty or examinations of candidates for degrees. Of course the expense of graduation will not be increased.

This request was granted on October 14, 1807. As a side light on the life of Dr. Physick it is noteworthy that despite his ill health, resulting from two attacks of yellow fever, he was able to rise above his infirmities and mount the pedestal of fame. Thus man's spirit masters his physical being!

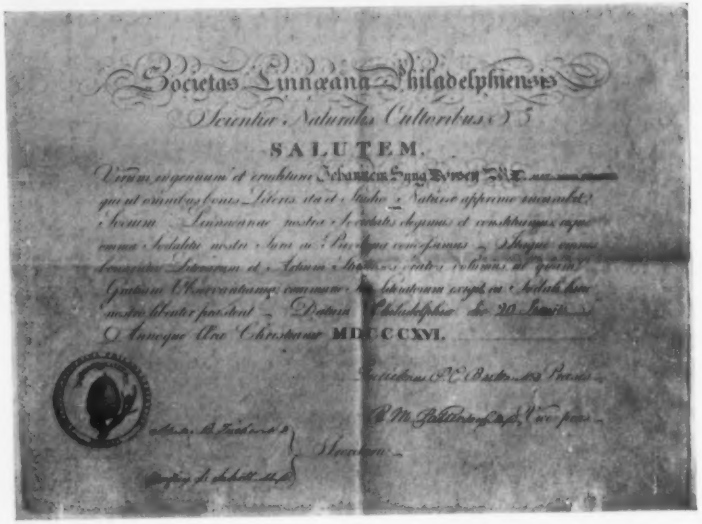
The young adjunct professor discharged his new duties with a thoroughness and ability which soon made him popular among his students: his whole soul was wrapped up in his chosen calling and no claims, even those of music and poetry, were superior to those of his profession. In the same year in which he became adjunct professor he married a charming and highly-cultured young lady, Maria Ralston, daughter of a prominent Philadelphia merchant. However, Dr. Dorsey's new obligations, family as well as social, were not permitted to interfere with his work. He prepared and delivered his lectures, assisted his uncle in operations and performed some himself, recorded all the interesting cases in his uncle's and his own surgical practice and in 1813 became the author of two volumes of the "Elements of Surgery," illustrated mostly by himself. This work received wide recognition, being reprinted at Edinburgh and used as a text-book at that university. In it Dorsey reflects the greatness of his uncle, of whom it has been said: "Nihil tetigit quod non ornavit." Dorsey has not had time to acquire independent experience but he had the remarkable faculty of assimilating the experience of others. "The American surgeon," he said, "is or ought to be strictly impartial and therefore adopts from all nations their respective improvements."

Dr. Physick had contributed perhaps more than any other man to the improvement of surgical technic and his improvements Dorsey faithfully adopted, having no doubt assisted his uncle in the elaboration of many of them. Dr. Physick's gorget has been described by Dorsey in his book and mentioned in his notes. Desault's splint had been modified by Physick; he also devised the angular splint for fracture of the humerus; the curved forceps for taking up deep-seated arteries; an improved method of treating artificial anus; of introducing a catheter in cases of retention of urine; a new method of re-

Societas Medica Philadelphiensis
Anno Domini MDCCLXXXIV Constituta
Omnibus qui hæc legerint
Salutem.

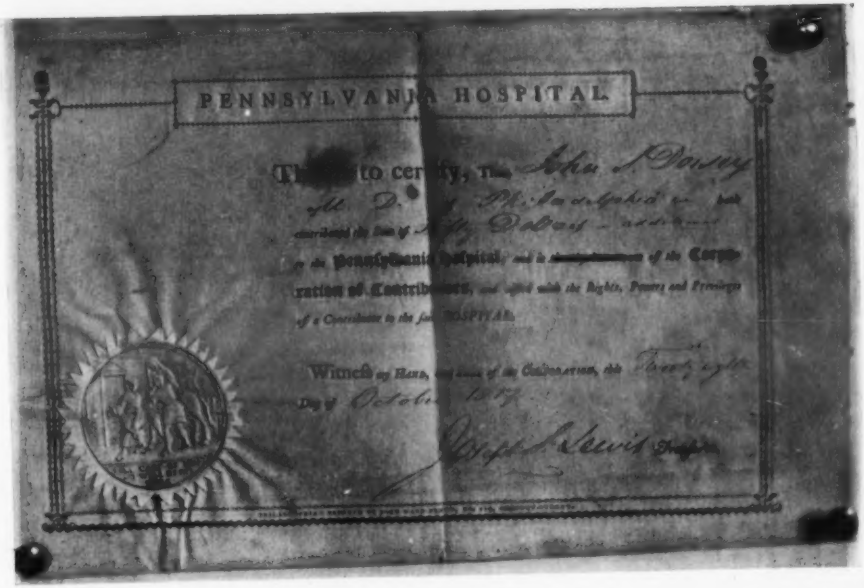
THEATRE OF ANATOMY
GREAT WINDMILL STREET.

JOHN SYNG DORSEY M.D.


Societas Linnæana Philadelphiensis
Scientiæ Naturalis Cultoribus
SALUTEM.

WE The attending Managers and Physicians OF THE
PENNSYLVANIA HOSPITAL,
Do Certify That John Syng Dorsey Student of Medicine
of the City of Philadelphia
of the said HOSPITAL for four Years
In Testimony whereof We have respectively set our Names to this
Certificate and caused the Seal of the Hospital to be thereunto affixed this
Managers
attending Physicians

Societas Medica Philadelphiensis
ANNO DOMINI
Omnibus qui


PENNSYLVANIA HOSPITAL
This is to certify, That John S. Dorsey
of the Pennsylvania Hospital, and is
ration of Contributors,
of a Contributor to the said HOSPITAL.
Witness my Hand,
Day of October

ducing dislocation of the thigh; and he was the first to apply animal ligatures to secure the vessels in amputations (1814).

In 1813 Dorsey became professor of materia medica at the University of Pennsylvania, a position which admitted him into the faculty. This position he filled with singular ability until 1818 when he was appointed to the chair of anatomy made vacant by the death of Dr. Wistar.

Having thus risen to eminence at the age of 35 it would seem that Dr. Dorsey had before him a life of comparative ease and a great deal of usefulness. His own poetic vision must have conjured a delightful picture of a happy useful life, one full of interest, amidst grateful patients, devoted friends and admiring pupils, but while the words of his brilliant introductory address were still fresh in the minds of his hearers Dr. Dorsey was dying from an attack of typhus which developed the evening of the same day in which he delivered his last lecture.

The last verses Dr. Dorsey wrote shortly before his death show the agony of soul upon the brink of the great Unknown:

There is a moment hastening on
When I must bid this earth farewell.
When all my numbered moments gone
My soul must steer for Heaven or Hell.
At that dread hour how shrinks the soul;
The body trembles, too, with dread.
Long joined, one sympathetic whole,
The man must mingle with the dead.
The dead! Oh, what mysterious change
Does death inflict on Adam's race.
Through what unheard of scenes of range. . . .

This cry was cut short, perhaps, by increasing weakness, for the last stanza ends abruptly, but imbued with deep religious convictions Dr. Dorsey passed the last moments of his life in religious talk with Dr. Janeway, who thus describes the death-bed scene:

On approaching his bed at the head of which his mother was sitting, Dr. Dorsey taking hold of a button on my coat, thus addressed me: "Doctor, is it not remarkable, after having delivered my introductory lecture, I was praying to my God, that He might not postpone my repentance to a dying bed; and *in one hour* after that prayer I was smitten with my disease."

The large room in which the doctor lay on his sick-bed was filled with ladies and gentlemen. There were present Doctors Physick, Chapman, and Hornes, Mr. Ralston, and several medical students.

Dr. Dorsey then made a request to be baptized, which was done by Dr. Janeway. His last words were: "I have a desire to live and remain with my family; but my desire to be with Christ is far greater."

Thus died a man who, had he lived longer, would, perhaps, have equalled Hunter or Wistar; a man in whose untimely death medicine lost perhaps more than we can estimate; a man whose short life was so remarkable for its varied and useful activity as to ensure his being remembered. What was it which made him famous at an age when many a man only dreams of fame? It was not inherent ability alone, for many an able man is passed by unrecognized. It was not personality, for many an amiable and generous man lives and dies unnoticed save for a few intimate friends. It was not erudition for he had not yet contributed anything of importance to science. It was not skill as a surgeon for he had not had time to surpass his uncle, Dr. Physick, and there are any number of successful surgeons whose names do not appear in biographies of great men. No, he embodied in his life work the three fundamental principles of success: Singleness of purpose, devotion to duty and untiring effort. When these are combined with natural talent fame is the invariable result. It is work that makes the successful man. It is untiring, unremitting effort that enables one to achieve the results which alone attract attention. Talent, nay genius, without work is like a fertile field that is not cultivated—it differs from a barren desert only in its possibilities. In his introductory address on anatomy Dr. Dorsey, speaking of himself, said:

The present incumbent is well aware that much strength must be necessary to flex the bow of Ulysses; yet he ventures without affectation or diffidence to attempt it and not without a hope that at a future day he shall have achieved by diligence some better claims to his present distinction. All he can even promise is his honest, zealous, and unremitting effort to discharge those duties heretofore performed by men whose memories are embalmed in the heart of every votary to medical science and whose glory, no longer in its zenith, still casts some lingering beams around the horizon, once illuminated by their noontide splendor.

It is this honest, zealous, unremitting effort that has characterized Dr. Dorsey throughout his life and has made him famous.

STUDIES IN GENITO-URINARY SURGERY

THE JOHNS HOPKINS HOSPITAL REPORTS, Volumes XIII and XIV, now ready. Volume XIII consists of about 605 pages with 201 figures in the text, six plates and one colored chart.

Volume XIV consists of about 632 pages, and has 97 figures in the text.

The price of each volume is five dollars ($5.00), bound in paper, and five dollars and fifty cents ($5.50), bound in cloth.

Remittances and orders will now be received.

THE JOHNS HOPKINS PRESS, BALTIMORE, MD.

INTESTINAL ANASTOMOSIS WITHOUT OPEN INCISIONS BY MEANS OF BASTING STITCHES.

(Illustrated.[1])

By Edward Mason Parker, M. D.,

and

Harry Hyland Kerr, M. D., C. M.,
Washington, D. C.

The fact that from five to ten new methods for intestinal anastomosis continue to be described each year is itself strong evidence that the perfect way has not yet been found. The very multiplicity of methods, therefore, furnishes an excuse for suggesting still another, but at the same time it increases in proportion the obligation to make good. Only the best of reasons can justify the addition of one more to the long list, especially since in recent years the technic of intestinal anastomosis, long in a very chaotic condition, seems to be approaching the uniformity and precision of an established method. As Monroe has said, "The simplicity, cleanliness, rapidity and safety of the clamp and suture operation are strong arguments at the present time against any substitutes."

But if the question be asked in what way can the present methods in intestinal operations be improved upon, an obvious answer presents itself. The way to improve the technic of operations for intestinal anastomosis is to eliminate the open incisions. Two separate and entirely different considerations point directly to this conclusion. These relate to what may be called the two general requirements in intestinal surgery: namely, asepsis and facility in operating.

No argument is needed to show that a gaping intestinal wound introduces a serious difficulty into the aseptic problem. Whenever the intestinal lumen is opened, or even when an instrument or ligature is passed into it, and out again, soiling of the peritoneum with at least minute portions of intestinal contents, swarming with bacteria, is almost inevitable. Although we are accustomed to good results in suturing gunshot and other open intestinal wounds, where we are compelled to rely upon the natural resistance of the tissues to infection rather than upon the maintenance of aseptic conditions, we are not therefore justified in introducing this complication into all intestinal operations, if it can be shown to be unnecessary, for the danger from operative soiling is a real one and is clearly unavoidable in the presence of an open incision.

The conclusion is almost equally clear when we consider the question of facility. To meet this requirement a vast amount of ingenuity has been exercised in the invention of mechanical devices of which the Murphy button is the most brilliant example. The disadvantages of methods of intestinal suture without mechanical aids, have been most clearly stated by Halsted. These are briefly: length of time and number of assistants required; vermicular action of intestine and rolling out of mucosa, preventing accurate disposition of stitches and recognition of precise edges; difficulty of adjusting pieces of intestine not of the same size; excessive handling of the intestine tending to injure the peritoneum and predispose to infection. Every one of these difficulties, with a single exception, which will be presently shown to be apparent rather than real, is evidently due to the presence of the open incisions.

It is the object of this paper to present a preliminary report, based upon some experimental operations upon dogs, of an attempt to find a way out of this difficulty which confronts us in each of these two widely different problems.

The suggestion which we have to offer does not depend upon any new principle or require the use of any ingenious new instrument or stitch. It is rather a simple and almost obvious application of old and well-tried methods in a way which appears to us to solve the problem of the open incisions. It may be defined as an easy and rapid method of suturing, applicable to every form of intestinal anastomosis, whether circular, lateral or end-to-side, whereby the immediate formation of a patent stoma may be accomplished without operative opening of the intestinal lumen, and without the introduction into it of any instrument or ligature.

An almost incredible number of methods for suturing the intestines have been suggested. F. G. Connell in 1899, reviewing the methods to that date, enumerated no less than one hundred and twenty without exhausting the list. Our search of the literature up to the present time has been rewarded with over eighty more. Many of these of course are based upon identical principles showing only slight and unimportant variations, as for example, many of those among the large class of bobbins of decalcified bone or other material. All of them, however, deal specifically with the problem of uniting intestinal wounds, other variations in operative procedures not being included in the list.

Among these approximately two hundred methods of intestinal suture which have been suggested or tried there are some twenty-five in which the object aimed at has been to eliminate more or less completely, at least during some of the steps of the operation, the open intestinal incisions.

These methods fall naturally into two classes. First, those in which an immediate opening is formed and second, those in which the new stoma is intended to be established by pressure necrosis after a variable interval.

[1] We desire to express our thanks to Dr. W. M. Gray for the photographs.

In the first class there are two divisions; (a) those in which all the sutures are first placed and most of them tied, the incision being made at the last moment and the final sutures then tied. This division embraces the methods by Halsted, Ferguson, Lundholm, Gilbert, Werelius, Flint and Baumgartner; but all of them apply only to lateral anastomosis, so that when a resection is done there still remain the open incisions of the divided ends.

The second division of this class (b) includes those in which the incisions are made at the beginning and are kept closed by a clamp or other device while the sutures are being applied. Such are the methods of Laplace, Downes, and Keefe, which apply to circular suture; the method of Graser, which applies only to resection of portions of the stomach without anastomosis, and those of O'Hara and Rostowzew, which apply to all anastomotic operations. All these depend upon the use of special clamps, and, in all of them except those of Graser and Rostowzew, the instrument enters the lumen of the intestine at some time during the procedure. This division includes also the method with hairpins of French, and the method with knitting-needles of Pleth.

In the second class, in which the new stoma is to be formed by necrosis after an interval of several days, the best-known means are the McGraw elastic ligature and the twine triangular stitch of Maury. Other similar ligature methods are those of Postnikow, Knie and Podrez. Here also belongs a recent method by Senn in which a clamp instead of a ligature is used.

Of curious, rather than practical interest, are those methods reviewed and revived by Sato in 1904, in which intestinal walls are stitched around an area devitalized by the thermocautery (Bastianelli, Chaput, and Powel) or by crushing followed by cauterization with a chemical substance (Souligoux) or even around a cauterizing substance in the form of a tablet (Boari). All the methods of this class of course apply solely to lateral anastomosis, and open incisions have still to be dealt with where portions of the bowel are resected.

It may be noticed that all but seven of these methods are limited to lateral suture. Of these four apply only to circular suture, one is not an anastomotic operation, so that only two, those of O'Hara and Rostowzew, are applicable to every form of anastomosis. In but one of these methods (the last named) is absolute exclusion of communication with the intestinal lumen maintained throughout every step of the operation.

The procedure to which we wish to call attention is an extremely simple one. It consists essentially in the use of a Cushing continuous stitch, without knots, to temporarily close the intestinal incision, a separate stitch being used for each of the two visceral openings that are to be sewn together. These stitches remain in place only while the permanent sutures are being applied. On account of their method of application and the temporary purpose which they serve, they bear a certain likeness to the "basting" stitches of the seamstress, and for convenience we have called them by that name.

The steps of the operation and the advantages which we believe it to possess may be briefly summarized as follows:

Division of the intestinal walls is made between two narrow-bladed crushing clamps, placed first in actual contact and then slightly separated so that there is left between them a narrow crushed area, consisting practically only of serosa and fibrous coat, which may be divided by the knife or cautery.

The basting stitch is a Cushing continuous stitch without knots, placed upon the clamped incision with the loops between the stitches crossing over the blades of the clamp. When the clamp is removed and the stitch at the same time drawn tight, the edges of the incision are automatically inverted and held firmly pressed together in a straight line without any separation of the lips of the opening having occurred. The two incisions, so prepared, are then placed side by side, and are stitched together around the whole circumference of the intestinal tube or of the new operative opening that is to be established. When the last suture has been placed and tied, the basting stitches are cut short and withdrawn, the intestinal canal, or the new anastomotic stoma, then instantly becoming patent. This completes the operation as far as the suture of the intestines is concerned. The lumen has not been opened and it has not been entered by any instrument or other object. The stoma becomes open only with the withdrawal of the basting threads. The steps of the operation are essentially the same whether circular, lateral or end-to-side anastomosis is done.

The operation so performed calls for no time-consuming maneuvers and no more than ordinary manipulative skill. The basting stitches are as easily and as quickly placed as the purse-string suture used to turn in the stump of the appendix or grasp the Murphy button. Upon removal of the clamp, the stitch is at once drawn tight by a single motion and the incision, securely closed in a straight line, is then ready for suturing without further attention. The turning of the cut edges which takes place is automatic and never requires the use of an instrument to assist it as in the case of the purse-string suture.

With the two basting stitches in place, intestinal suture at any rate in dogs, becomes singularly free from its usual difficulties. Only a single assistant is ever needed, and even he may be readily dispensed with. The parts to be joined are held in the most convenient position and under perfect control, so that the stitching is done with surprising rapidity and ease.

The troublesome eversion of the mucosa and the vermicular contractions of the muscular coats no longer exist. Approximation of serous surfaces to any desired extent and at a uniform distance from the margins of the incision is assured. The inversion of the cut edges presents a folded wall through which to pass the stitches making precision in their application, with secure anchorage in the fibrous coat, particularly easy.

Handling of the intestines is reduced to a minimum. The hands of the operator need scarcely touch them, and those of the assistant not at all.

In end-to-end suturing the small triangular peritoneal defect at the mesenteric border is automatically obliterated

by the basting stitch insuring apposition of serous surfaces at this point.

A striking advantage of the method is seen when the two incisions to be joined happen to be of unequal length. In this case the longer one is simply puckered or "gathered" in upon its basting thread until it corresponds in length with the shorter incision and the sutures are then applied. We have successfully united in this way without the slightest difficulty intestinal incisions, one of which was double the length of the other.

In the beginning of the experimental tests of this method a single discouragement was met with. This occurred in the first three operations upon dogs, done on three consecutive days, the animals dying of obstruction due to turning in too much of the intestinal wall. This is the one fault to which the method may easily lend itself if the operation is carelessly done, but one which it is equally easy to avoid. It is practically only in dogs of small size, or in young children, with intestines having a very small lumen and relatively thick walls that this danger applies. At any rate our subsequent success even with dogs of the same size demonstrated, at least to our own satisfaction, that these initial failures were not due to a fault inherent in the method.

For a more detailed description of some of the steps of the operation which is necessary it will be sufficient to take the classical example of end-to-end suture after resection.

At each point where division of the intestines is to be made two parallel clamps grasp the flattened tube transversely or at an angle from the free border to the mesenteric border. The method of dividing the intestinal walls between these clamps has already been described. Circumvection ligation of the mesenteric vessels going to the portion to be resected and removal of that portion follow. There remain then the two intestinal ends that are to be joined, each closed by a strong clamp. The intestinal walls have been divided flush with the blades of the clamp so that no tissue whatever projects.

The next step is the application of the basting stitches. Holding the clamp in his left hand the operator enters the first bite of the stitch on the side of the flattened intestinal tube facing him, close to the mesenteric border, at the point where the peritoneum begins to be reflected away from the bowel wall. This first bite of the stitch is taken parallel with the axis of the intestines and in a direction toward the clamp emerging about 1 mm. from its edge. Now turning over the clamp the thread passes over its blades and the second bite of the stitch is taken in the opposite side close to the mesenteric border as before, but this time parallel with the blades of the clamp and about 1 mm. from its edge. These first two stitches are most important since by them the mesenteric angle is turned in obliterating the peritoneal defect at this part of the incision. The third, fourth, and following stitches are exactly like the second and are taken alternately, first in one side, and then in the opposite side, until the free border is reached. The last bite of the stitch, taken in the free border, is again like the first bite, parallel with the axis of the intestine but this time taken in a direction away from the clamp, entering about 1 mm. from its edge. Thus the first and last stitches in the mesenteric and free border respectively, are parallel with the axis of the intestine. All the intervening stitches are parallel with the blades of the clamp and as close as possible to its edges. All the loops of the stitch pass loosely over the blades of the clamp.

It will be seen that this is simply a Cushing right-angled continuous stitch, since all the individual stitches on one side of the incision correspond with intervals between stitches on the opposite side, exactly as in the Cushing stitch.

Both ends of the basting threads are left eight or ten inches long. No knots are tied. We use medium heavy white silk for the basting threads to distinguish them from the black silk used for sutures. A straight or curved intestinal needle may be used as preferred.

The clamp is now loosened and carefully drawn from under the loops of the stitch. The thread is grasped, one end in each hand, and by separating the hands strongly is made taut, the effect being to produce instant and automatic inversion of the edges and secure closure of the incision in a straight line. Both mesenteric and free borders are inverted as well as the lateral walls.

When the crushing clamp grasps the intestinal tube it pushes aside the mucous membrane on the inside and the two muscular coats on the outside, leaving practically only fibrous coat and serosa between its blades. When the clamp is removed there is seen a narrow ridge of crushed tissue consisting of these coats of the two intestinal walls glued together by the pressure to which they have been subjected. Even in the dog's intestine with its thick muscular coats, the lips of the incision do not separate during the few seconds intervening between the removal of the clamp and the pulling taut of the basting stitch. Unless this is purposely delayed, allowing time for the vermicular action of the muscular coats to pull apart the edges, the mucous membrane is never seen.

The other end of the divided intestine having been prepared in the same way, the next step is the uniting of these two ends by sutures. The assistant grasps the long free ends of the two basting threads, those from the mesenteric borders in one hand and those from the free borders in the other, and holds the two threads taut and parallel with each other, adjusting them so that the two intestinal ends, hanging from the middle of the threads between his hands, unite mesenteric border with mesenteric border, and free border with free border. It will be seen that when the two ends of the flattened tube are so held there are four intestinal walls lying in contact with parallel edges.[2] A detailed description of the application of the sutures is unnecessary. Almost any form of a stitch may be used. Turning the corners presents no difficulties. Two precautions are essential—not to cross the line of the basting thread with any of the stitches and not to catch the basting

[2] In operations upon dogs we have sutured usually the two inner walls first (Fig. 6), but in the thinner walled human intestine it would be easier to begin the suture by bringing the two outer walls in apposition (Fig. 7).

thread itself with a stitch. When the permanent stitching is finished and the basting threads have been cut short and withdrawn, the intestinal tube is rolled between the fingers at the suture line to make sure that the lumen is patent.

We do not desire to recommend any particular form of suture to be used exclusively in this method. We feel sure, however, that the general preference for a continuous stitch in circular suture of the intestine is well founded. The tension to which intestinal stitches are subjected under ordinary conditions comes almost wholly from internal pressure in the intestinal tube. In hydrostatics the law which applies to such a case is that, in a thin-walled tube subjected to internal pressure, the circumferential strain upon the walls of the tube is double the longitudinal strain. As applied to circular suture of the intestines this means that the longitudinal strain which tends to pull the edges of the incision apart, equals only half of the circumferential strain which tends to tighten the stitch if a continuous suture has been used.

Hemorrhage in intestinal operation is not likely to give trouble with this method, but it would be unsafe to conclude that it might not do so in operations upon the human stomach, and therefore the method is far from having been sufficiently tested to be recommended for that work.

The assistant may be altogether dispensed with. The operator in that case passes the long basting threads over the thumb and index finger of his left hand with the two intestinal ends hanging between them, the ends of the threads being twisted around the little finger to hold them taut.

It is possible to put in the basting stitches before instead of after the incisions have been made, but the method does not seem to us to have any advantages over the one described.

An attempt to show how quickly any procedure may be carried out in an experimental operation seems unprofitable and misleading, we have therefore never tried to make a record. Working deliberately and doing each step with painstaking care, we find, comparing a number of trials, that the application of the two basting stitches, removal of the clamps, and drawing taut of the threads, requires about four minutes. A single continuous stitch around the circumference of the stoma takes about four or five minutes more, so that the time required for the intestinal suture proper may be placed at about ten minutes. This leaves out of account the time required in the resection, and in opening and closing the abdomen.

In the following fifteen observations, dogs ranging in weight from 13 to 30 pounds were used. They were all thoroughly anesthetized with ether. The after treatment consisted of fluid diet after twenty-four hours, and chopped meat after two or three days.

The specimens were examined from three to 100 days after operation and a fair idea of the process following the suture could be obtained. In no case was there any leakage. In the first three cases a solid septum had formed from the careless turning in of too much tissue. This was never encountered again. In experimenting by this method with calves' intestine or dead human intestine, where the lumen is large and the walls proportionately thin, the turned-in edge was not more than one-eighth of an inch wide and offered no stricture or possibility of obstruction. In one case examined three days after operation the turned-in edges had atrophied to a fine fringe of tissue one-sixteenth of an inch wide. Two others in which a transverse end-to-end anastomosis had been made, some stricture with dilitation and hypertrophy was found. This was first noted by Edmonds and Ballance in 1896 and advanced as an objection to end-to-end anastomosis. In the subsequent cases this was entirely done away with by using the oblique incision. Stricture, hypertrophy or dilatation have never been found following this procedure.

OBSERVATION No. 1.—End-to-end anastomosis. (5-17-07) 23-pound dog. Ether anesthesia. High median incision and a loop of small bowel delivered. Clamps (blades ¼ inch wide) applied transversely to the bowel axis and 4 inches of gut excised. Basting stitch of white silk, parallel to the clamps and ⅛ inch from them. Clamps withdrawn and basting threads drawn taut. Invagination good. No hemorrahge. Anastomosis made with one running Cushing suture of black silk, approximately ⅛ inch from the basting stitch. Basting stitches withdrawn.

Result.—Death on eleventh day from obstruction.

Autopsy.—Peritoneum healthy. Line of suture intact, with extreme dilatation above and collapsed bowel below. Stricture complete; turned-in ends of the sutured bowel having become adherent across the lumen of the gut and organized into a solid septum.

OBSERVATION No. 2.—End-to-end anastomosis. Twenty-pound bitch. Ether anesthesia. High median incision. Small bowel delivered. Clamps (¼ inch wide) applied transversely to the bowel axis and 5 inches of gut excised. Basting threads drawn taut. Invagination imperfect on account of projection of wide crushed area. No hemorrhage. Anastomosis made with interrupted Halsted mattress sutures of one-half the circumference and an inverted oblique Lembert suture in the other half. Basting threads withdrawn.

Result.—Death on the seventh day from obstruction.

Autopsy.—Peritoneum healthy. Line of suture intact with moderate dilatation above a complete stricture. The same condition obtained as in the previous experiment, *i. e.* a complete diaphragm had formed from the organization of the turned-in edges.

OBSERVATION No. 3.—End-to-end anastomosis. Thirteen-pound dog. Ether anesthesia. Low median incision. Small bowel delivered. Clamps applied transversely and a small portion excised. Basting stitch over clamps. Clamps removed and basting threads drawn taut with perfect invagination. Anastomosis made with one running Cushing silk suture. Basting threads withdrawn.

Result.—Death on third day from obstruction.

Autopsy.—Peritoneum healthy. No adhesions. Line of suture intact. Stricture complete with considerable dilatation above and collapsed bowel below.

In these cases too much bowel wall (about ½ inch which was greater than the radius of the gut) was turned in, and becoming adherent across the lumen, formed a diaphragm. Cases 2 and 3 were done before the result of case 1 was known. Had we realized that each step, the clamp (¼ inch wide), the basting stitch and the suture successively turned in more bowel wall, these fatalities might have been avoided. We then had made by Lenz and Lossau of Washington a strong narrow clamp with longitudinal serrations on its crushing edges and

the blades bevelled away on one side to facilitate the placing of the basting stitch close to it. We also decided to operate on larger dogs.

Observation No. 4.—End-to-end anastomosis. Large 28-pound bitch. Ether anesthesia. Low median incision. Small bowel delivered. New narrow clamps applied transversely to the axis of the gut and portion excised. Basting stitch applied over clamps. Clamps removed. Basting threads drawn taut causing good invagination. Anastomosis made with one continuous Lembert suture of silk. Basting threads withdrawn.

Result.—Good.

Subsequent operation with removal of specimen 26 days after first. Peritoneum healthy. Few adhesions to anastomosis which was excised. Line of suture intact with slight constriction, and some hypertrophy and dilatation for about 3 inches above.

Observation No. 5.—End-to-end anastomosis. Twenty-five-pound dog. Ether anesthesia. Low median incision. Narrow clamp applied transversely to small bowel and a portion excised. The actual cautery was used for one incision. Basting threads drawn taut giving good invagination. Anastomosis made with a Connell running suture of silk. Basting threads withdrawn.

Result.—Good.

Subsequent operation 19 days later with removal of specimen. Peritoneum healthy. Anastomosis intact with slight constriction, and considerable dilatation and hypertrophy above.

Observation No. 6.—End-to-end anastomosis. Same dog as in Observation No. 5. Ether anesthesia. Low median incision. The old anastomosis delivered and excised between the narrow clamps which were applied transversely to the bowel axis. Basting stitches over clamps. Clamps withdrawn. Basting threads tightened and anastomosis made with a continuous oblique suture of silk. Basting threads withdrawn.

Results.—Good.

Dog still living.

In the three previous cases where we obtained larger dogs with much difficulty the results were good, but in the two that were subsequently examined at a later operation, slight stricture with hypertrophy and dilatation above, as noted by Edmonds and Ballance, was found. This led us to adopt the oblique incision of the gut; i. e., at an angle of 45 degrees to the intestinal axis. It can be demonstrated mathematically that this gives a lumen double in area that of the incised bowel. We were interested and not a little surprised to find that on making the anastomosis after an oblique incision, absolutely no angulation was apparent but only some "bagging" of the mesenteric border. Even at later removal of these specimens, the bowel at the site of suture was apparently straight. On distension with water it assumed a slight angle of say 160 degrees and on slitting it up along the free border a funnel-shaped depression at the mesenteric side was the only evidence of the oblique incision. Again, the dilatation and hypertrophy of the bowel wall above this line as found in cases 5 and 6 was entirely done away with. It has never been noted following oblique anastomosis.

The danger of turning in too much margin due to the narrow gut of the dog and proportionate great thickness of its walls was easily overcome by this procedure. It is not necessary in the human adult intestine, but might be found useful in small children where the proportion between the size of the bowel and the thickness of its walls more nearly approaches that found in dogs.

Observation No. 7.—End-to-end anastomosis. Twenty-pound dog. 1½ gr. morphine followed by ether anesthesia. Low median incision. Small bowel delivered. Clamps applied obliquely to the gut axis and portion between them excised. Basting stitch over clamps. Clamp withdrawn. Basting threads drawn taut. Anastomosis made with running Lembert sutures of silk. Basting threads withdrawn.

Result.—Death on third day from pneumonia.

Autopsy.—Peritoneum healthy. Line of suture intact. No stricture, no dilatation. No angulation apparent. Both pleura filled with fluid. One lung consolidated. The specimen removed showed a perfectly tight joint without angulation. On section there was no evidence of a diaphragm. A slight fringe of thin tissue possibly 1/16 of an inch wide was all that was left of the turned-in portion of the bowel wall after two days. That portion crushed by the clamps and subsequently turned in (consisting of fibrous and peritoneal coats) evidently had undergone rapid atrophy.

Observation No. 8.—End-to-end anastomosis. Small 15-pound dog. Ether anesthesia. High median incision. Small bowel delivered and a portion excised between narrow clamps which were applied obliquely to the gut axis (about 45 degrees). Basting stitch over clamps. Clamps withdrawn. Basting thread drawn taut and anastomosis made with a running oblique silk suture. Basting threads withdrawn.

Result.—Good.

Subsequent operation 54 days after the excision of specimen. Peritoneum healthy. Line of suture intact with no constriction and no dilatation. No appreciable angulation was apparent but on slitting up the specimen a funnel-shaped depression was seen in the mesenteric border at the line of suture.

Observation No. 9.—End-to-end anastomosis. Fifteen-pound dog. Ether anesthesia. Incision through rectus. Small bowel delivered. Clamps applied obliquely to the axis at about an angle of 45 degrees. Basting stitches over clamps. Clamps removed. Basting stitches drawn taut and anastomosis made with running Lembert suture of silk. Basting threads withdrawn.

Result.—Good.

Dog killed 36 days after operation.

Autopsy.—No stricture, no dilatation. No angulation of gut apparent.

Observation No. 10.—End-to-end anastomosis. Seventeen-pound dog. Ether anesthesia. Incision through rectus. Small bowel delivered. Clamps applied obliquely. Portion excised. Basting stitches over clamps. Clamps removed and basting threads drawn taut. Anastomosis made with running Lembert suture of silk. Basting threads withdrawn.

Result.—Good.

Dog killed 30 days after operation.

Autopsy.—Peritoneum healthy. Line of suture intact. No dilatation. No stricture. Again no angulation was apparent and when the gut was distended with water an angle of only 160 degrees or less was found.

Observation No. 11.—End-to-end anastomosis. Fifteen-pound dog. Ether anesthesia. Incision through rectus. Small bowel delivered. One clamp applied obliquely and one transversely. Portion of gut excised. Basting stitches over clamps. Clamps removed. Basting threads drawn taut. Oblique incision had to be gathered on its basting thread to conform to transverse incision. Anastomosis made with running Lembert suture of silk. Basting threads withdrawn.

Result.—Death from obstruction 10 days after operation. Peritoneum healthy. Line of suture intact. Stricture absolute

FIG. 1.—Two clamps have been placed across the intestine preparatory to division of its walls. The portion to the observer's left is the portion to be resected. Observe the oblique angle.

FIG. 2.—Intestinal walls have been divided. The clamp at the observer's left is upon the end which is to be sutured.

FIG. 3.—The basting stitch has been placed in position upon the clamped incision.

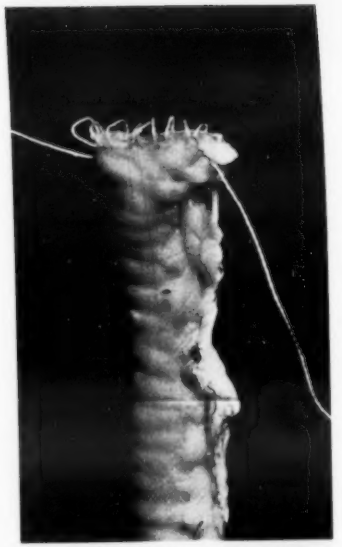


FIG. 4.—The clamp has been withdrawn from under the loops of the stitch. The narrow ridge of crushed tissue is seen showing the marks made by the longitudinal serrations of the clamp. At the observer's left the incision is beginning to gap open slightly during the time necessary to adjust the specimen for the photograph.

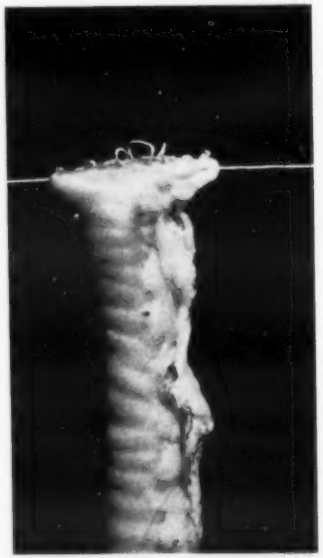


FIG. 5.—The basting stitch is in the act of being drawn taut, three loops still showing in the center.

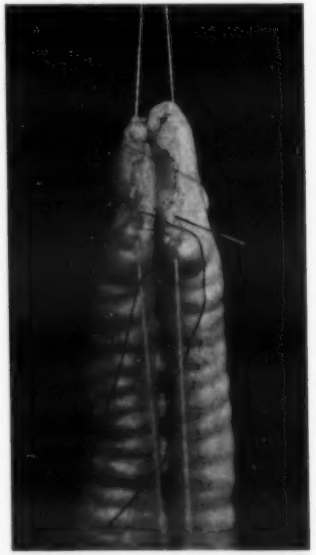


FIG. 6.—The two basting stitches have been drawn taut and the intestinal ends are held in position by the basting threads. The suture has been begun upon the intestinal walls which lie in contact.

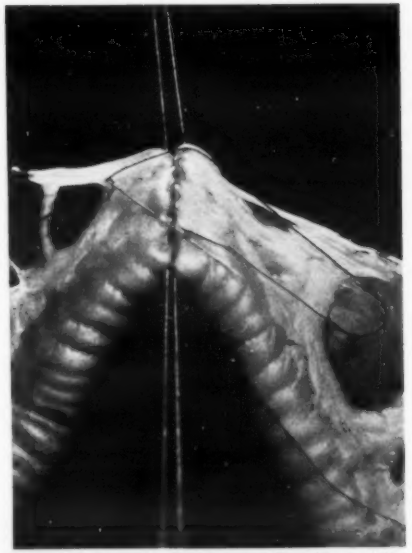


FIG. 7.—The suture has been continued around the mesenteric angle and across the two anterior walls nearly to the point of starting.

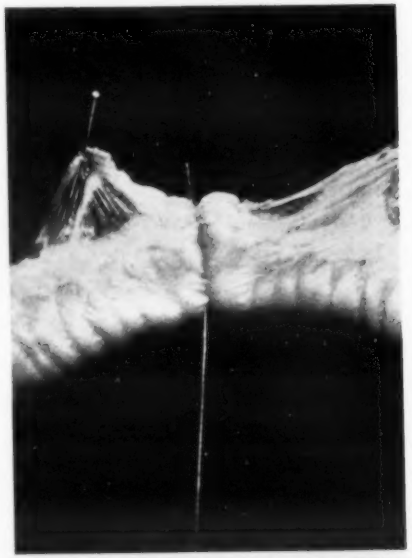


FIG. 8.—The suture is complete. The basting threads have been cut short. One of them has been withdrawn. With the withdrawal of the other the lumen will become open.

with extreme dilatation above and collapsed bowel below. The lateral wall of the gut on either side of the suture line had become adherent for about 3 inches and caused an acute kink at that point.

OBSERVATION No. 12.—Lateral anastomosis. Sixteen-pound dog. Ether anesthesia. High median incision. Small bowel containing old anastomosis (Observation No. 7) delivered. Clamps applied transversely and specimen of previous operation excised. Basting stitches over clamps. Clamps removed. Basting threads drawn taut. Basting thread was then utilized to complete the closures of the blind ends as a running Lembert stitch along the invaginated end.

At the free border of the gut near each closed end, three needles were plunged in to the lumen of the bowel and brought out again about ¼ inch from the point of entrance. They were placed parallel, about ½ inch apart and at right angles to the bowel axis and plane of the mesentery. The clamps were then placed beneath these needles so as to grasp in their bite the bowel wall between the points of entrance and exit of the needles. This maneuver insured the grasping of mucous membrane in the clamp and a complete severance of all walls of the intestine when the strip of tissue above the clamp and containing the needles was cut away. The basting stitch was applied as in end-to-end suture over the clamps which were then removed and the basting threads drawn taut. Suture completed with continuous running Lembert suture and the basting threads withdrawn.

Result.—Good.

Subsequent operation 100 days later revealed healthy peritoneum. Line of suture intact with no dilatation and no stricture.

OBSERVATION No. 13.—End-to-end anastomosis. Sixteen-pound dog. Ether anesthesia. High incision through rectus. Small bowel containing specimen of previous operation (Observation No. 11) delivered, and specimen excised between clamps transversely to the bowel axis. Basting stitches over clamps. Clamps removed. Basting threads drawn taut. Ends of one basting thread (*i. e.* on the distal end) tied tight together, thus puckering up the invaginated bowel wall and effectually closing the blind end. No other suture used for this closure. About 1 inch from the closed end a clamp applied along the free border of the gut parallel to the axis and under two needles thrust into the lumen. Tissue in bite of clamp cut off with the knife close to clamp and basting stitch inserted. Clamps removed. Second basting thread drawn taut. It was then found that this longitudinal incision doubled that in the proximal end but by puckering or gathering the tissue on its basting thread the length of the two incisions was made equal and the difficulty easily overcome. Anastomosis made as usual with a running oblique Lembert suture. Basting threads withdrawn.

Result.—Good.

Dog killed 40 days after operation. Peritoneum healthy. Line of suture intact. No dilatation and no stricture.

OBSERVATION No. 14.—Posterior gastro-enterostomy. Nineteen-pound dog. Ether anesthesia. High median incision. Stomach and jejunum delivered. Clamps applied longitudinally under needles previously plunged into the lumen of both viscera to insure grasping of mucous membrane. Basting stitch of old silk that had been repeatedly sterilized applied over clamps. Clamps removed. One basting thread on being tightened broke in the tissues and had to be teased out. This necessitated exposing the lumen of the gut. Suture completed with a running Lembert stitch.

Result.—Good.

Dog killed 40 days after operation. Peritoneum healthy. Line of suture intact. No stricture.

OBSERVATION No. 15.—Posterior gastro-enterostomy. Seventeen-pound dog. Ether anesthesia. High median incision. Stomach and jejenum delivered. Clamps applied parallel to the long axis of each viscus and under needles previously plunged into the lumen. Strip of tissue containing needles cut away close to the clamps. Basting stitches applied as usual. Clamps removed. Basting threads drawn taut and anastomosis made with a continuous running Lembert suture of silk.

Result.—Good.

Dog killed 69 days after operation. Peritoneum healthy. Line of suture intact. No stricture.

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A CLINICAL STUDY OF THE ALKALINITY OF THE BLOOD.

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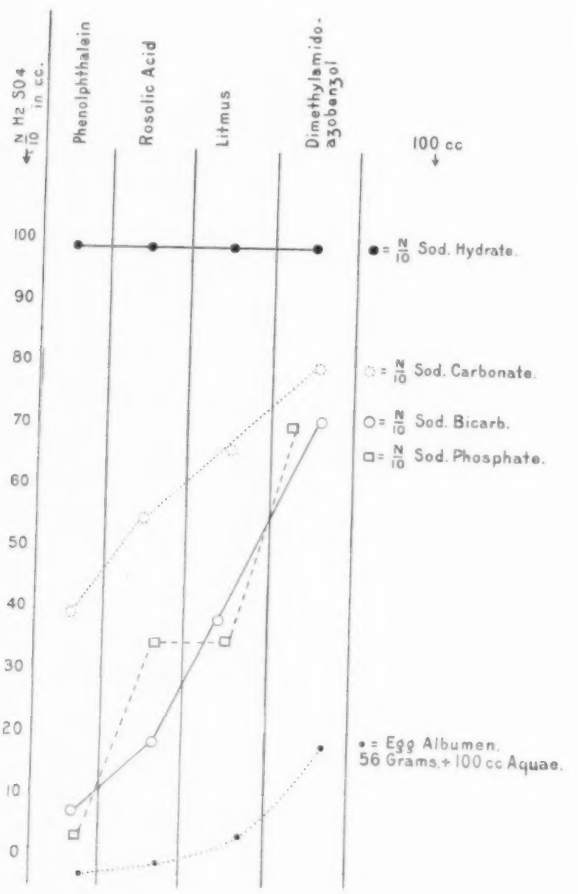
This work was undertaken at the suggestion of Dr. Thomas R. Boggs in order to determine, as far as possible, the value of clinical methods of measuring the alkalinity of the blood. So many methods have been proposed that trials of each have been impossible; and our work has been confined to some of the more promising and least tried ones. From actual studies, as well as a review of the literature, the conclusions which form the basis of this report have been formulated.

The blood is not an alkaline fluid in the sense that a solution of sodium hydrate is alkaline. It is a very complex mix-

ture of salts, mainly carbonates and phosphates, with other substances such as proteins which may combine with either alkalies or acids. Probably its most important constituents from the standpoint of alkalinity are sodium bicarbonate and sodium phosphate, which are really acid salts with an alkaline reaction to most indicators. As a matter of fact, all recent studies in physical chemistry have proved the practical neutrality of the blood, while Friedenthal by most interesting biological deductions has arrived at the same conclusion. It can

CHART I.



also be shown by simple titrations that the alkaline reaction of blood is not like that of a solution of sodium hydrate. Blood serum will give varying figures of alkalinity depending on the indicator used; to phenolthalein it is practically neutral, to litmus its alkalinity is represented by about 50 mg. of sodium hydrate per 100 cc. serum, to dimethylamidoazobenzol by approximately 300 mg. Now as shown in Chart I 100 cc. of a solution of $\frac{N}{10}$ sodium hydrate will be neutralized by practically 100 cc. $\frac{N}{10}$ sulphuric acid, no matter what indicator is used; but the amount of $\frac{N}{10}$ sulphuric acid required to neutralize 100 cc. $\frac{N}{10}$ sodium carbonate, sodium bicarbonate, or di-sodium phosphate varies tremendously, depending on the indicator, the reaction of the three latter salts being analogous to that of the blood.

Moreover it must be borne in mind that blood is a combination of materials in suspension and in solution, and that only a portion of the total alkalinity can be neutralized by the addition of acid: this the Germans call "titrirbare alkali" (neutralizable alkali) and is the same as "reactivity" as defined by Moore and Wilson. This neutralizable alkali has been the basis of most of the methods in use, but how far it does represent the true chemical *status* of the blood is not certain.

The relation of the serum to the whole blood is of great importance. It is known that the neutralizable alkali of the total blood is considerably greater than that of the serum, but as I have elsewhere shown, the relation is constant enough to allow of the use of serum for comparative clinical studies.

Clinical methods are not necessarily as accurate as laboratory methods; at best such methods are often a "compromise between accuracy and simplicity." They must be measured by the results obtained; if they are only of comparative value and yet of service clinically, they can be considered useful. In the effort to obtain accurate clinical methods in the study of the chemistry of the blood numerous difficulties are encountered, as is made evident by the great number of methods proposed and the results so far obtained. I have notes of about 35 methods; yet despite this we are hardly any further advanced toward an accurate method of measuring the alkalinity of the blood than we were in 1850 when Cahen *fils* proposed the first quantitative estimation.

The methods can be divided into three general classes:

(1) Titration.

(2) Carbon-dioxide estimation.

(3) Physical-chemical.

Physical chemistry has not yet given any methods suitable for clinical adaptation. Since Zuntz, in 1867, first attempted to measure the alkalinity of the blood by determination of the carbon-dioxide content there have been several further efforts to perfect such a method.

The results have been discordant, and furthermore as all carbon-dioxide determinations are based on gas analyses, they can not readily be adapted to clinical purposes. The discussion of clinical methods then is limited to titration. The inherent difficulties in titration are evident. The dual character of the blood, suspension and solution, the deep red color which interferes so greatly with the use of indicators, are obstacles in the way of accurate titration. The results obtained will depend to a great extent on the nature of the acid and indicator employed. Further some difference in results will be observed, depending on whether we titrate to neutrality as in the Loewy-Engel method, or whether we add an excess of acid and then titrate the uncombined acid with alkali. In the first case we measure simply the neutralizable alkali, in the second we are dealing with a more complex question owing to the presence of proteins, urea and other bodies which may take up the

excess of acid and yet not influence the indicator. An analogous reaction is seen when a mixture containing egg albumen, sodium carbonate, sodium bicarbonate, and sodium phosphate is studied, for such a mixture will give higher values of alkalinity when titrated with sulphuric acid to excess than when titrated to neutrality. This means that the total basicity and the neutralizable alkali of the blood are not the same. The Shultz-Shultzenstein method will probably measure the total basicity, while the Loewy-Engel will only give the equivalent of the neutralizable alkali.

The Engel method is as follows: 0.05 cc. blood is drawn into a special pipette, diluted with water and mixed. It is then blown into a small beaker and titrated with $\frac{N}{75}$ tartaric acid, which is dropped from a special burette. After each drop is added and stirred, it is tested on lacmoid paper. The end reaction is determined when the drop on the paper has a sharp red edge. The average normal blood requires about ten drops. As a known amount of blood is used, it is easy to calculate how much acid is required to neutralize 100 cc. of blood, and from this the sodium hydrate equivalent is expressed.

To obviate the physical difficulties of titration with whole blood, several investigators have used serum. As shown in a previous paper, while serum represents only a portion of the total neutralizable alkali, it does represent a fairly constant percentage of the total; and furthermore the use of serum allows of much greater technical simplicity than is possible with the whole blood. For this reason and because serum titration has not been tried as much as other methods, all our actual studies have been confined to serum. The method and the results obtained will be discussed later.

Until recent times when physical chemistry showed us that the blood is practically neutral, the results obtained by clinical methods of hæmalkalimetry have been as variously interpreted as the methods were numerous. From the mass of conflicting testimony little of real value has been given to medicine; according to some authors certain diseases were associated with reduced alkalinity, while other men found exactly opposite results in the same disease. The only disease in which unanimity existed was in diabetes in the stage of coma; although even here, Benedict by "electro-motor" methods, could not find a constant change. Digestion has been supposed to be associated with an increase in the alkalinity due to the secretion of HCl in the stomach, but this has been denied by as careful a worker as H. Straus of Berlin. The values for normal have varied from 182 mg. of NaOH per 100 cc. (Landois) blood to 533 (Engel), as seen in this table:

Landois,	182 to 218 mg.	NaOH per 100 cc. blood.
Lepine,	203 " 276 "	" " " " "
Berend,	450 " 500 "	" " " " "
Strauss,	300 " 350 "	" " " " "
Engel,	426 " 533 "	" " " " "
Loewy,	407 " 508 "	" " " " "
Orlowski,	240 " 267 (Litmus)	" " " " "
	267 " 289 (Lacmoid)	
Salkowski,	368 " 400 males	" " " " "
	302 " 314 females	

These averages have been obtained by the different investigators using different methods. Orlowski used the Engel method.

The figures in pathological conditions vary tremendously. Burmin found a decrease in 62 patients suffering from all sorts of diseases. Jaksch and Kraus note a decrease in febrile diseases in general: Loewy, Strauss, and Kireef believe that there is an increase or an inconstant change without rule. Karfunkel disagrees with the general opinion that in pneumonia the alkalinity is low; Kireef claims it to be high in typhoid, whereas others (Waldvogel) find it raised at the beginning of the disease, low towards the end. In this connection, it is of interest to mention certain experimental studies with relation to immunity. Fodor showed that the blood of animals given NaOH or KOH by mouth was bactericidal *in vitro*. Behring thought that the high alkalinity of the blood of white rats was the cause of their immunity to anthrax. Fodor believed that animals first react to infection by a rise in the alkalinity, followed by a fall; if the infection is conquered there is a second rise, but if unconquered, the alkalinity remains low. Calabrese considers the alkalinity of the bloods the means of guarding against the action of toxins.

The reported variation in the alkalinity in chronic diseases is smaller, possibly because of the cachexia which is fairly constantly present. The studies on cancer are most interesting. Karfunkel, Moore and Wilson disagree with the general opinion that in cancer the alkalinity of the blood is low; Moore and Wilson, correlating their results with work done in their laboratory proving that there is a decrease in the acidity of the gastric juice in cancer anywhere in the body, consider high alkalinity of the blood a possible etiological factor in cancer. In nephritis, cirrhosis of the liver, the last stages of pulmonary tuberculosis a reduced alkalinity is claimed, although it must be added that one or more investigators can be found to disagree with the conclusion in almost every case. In diabetes mellitus except in coma, Straus, Magnus-Levy, and Loewy found the alkalinity increased, whereas most investigators find it decreased. Practically all, except Benedict, find a decreased alkalinity in diabetic coma.

Our measurements have been confined to the serum. Our results obtained with the Wright method were published in a late number of this journal. Following the suggestion of Lumière, Lumière and Barbier, who claim to have investigated 500 indicators, and the more recent work of Adler, we made numerous tests with rosolic acid as an indicator; but we found the blood serum so nearly neutral to it and the end reaction so difficult to determine that titration was extremely unsatisfactory. The Dare apparatus has also been tried, but the delay in the end reaction and the consequent uncertainty of the exact point of neutralization offer serious objections to the use of this ingenious method. Moore and Wilson described a series of methods which they used with apparently excellent results. In all three they used the Wright capillary pipette: (1) titrating the serum with sulphuric acid, using a 1 per cent solution of dimethylamidoazobenzol as indicator; (2) titrating with sodium hydrate, using phenolphthalein as

indicator; (3) incineration, and titration of the ash as in method (1). We have employed with a few technical modifications the first two methods, but have not used the ash determination. With phenolphthalein to which blood is neutral or slightly acid, we were unable to obtain any results of value, agreeing in this respect with the authors. The work with dimethylamidoazobenzol gave results of interest.

Whereas with litmus paper the neutralizable alkali is equivalent to $\frac{N}{35}$ sulphuric acid, with dimethylamidoazobenzol it is $\frac{N}{6}$ to $\frac{N}{7}$. Therefore sulphuric acid is prepared in solutions from $\frac{N}{3}$ to $\frac{N}{10}$ in a series differing by half a dilution, so that we have ready $\frac{N}{3}$, $\frac{N}{3.5}$, $\frac{N}{4}$, $\frac{N}{4.5}$, etc. to $\frac{N}{10}$ acid. The indicator is a 1 per cent solution of dimethylamidoazobenzol in absolute alcohol. Blood is obtained in thoroughly cleansed capsules, allowed to clot, and the serum used 3 to 4 hours afterwards.

In all our work, blood has been obtained between 11 a. m. and 12 m. and readings made between 2 and 4 p. m. Moore and Wilson advise adding 8 drops of the indicator to each 100 cc. of acid, but we found it more accurate to add 1 drop to each cc. One cc. of each solution of acid with 1 drop of indicator is poured in watch glasses or the water-color palette, then by means of the capillary pipette equal amounts of blood serum and of say $\frac{N}{10}$ acid are drawn and mixed, then of serum and $\frac{N}{9}$, and so on with stronger acids until a slight tinge of red is seen in the mixture. The acid first giving this tinge is considered to measure the alkalinity. We found that the end reaction could be better appreciated if the titration began with the weaker acids and progressed towards the stronger, so that this procedure was constantly practiced instead of the reverse as done by Moore and Wilson. All the capillary pipettes had approximately the same bore: we kept a few in stock which were cleaned and used repeatedly, so that the volume of serum was practically the same in all experiments. The technic while simple in outline, is somewhat difficult in practice, and slight variations from an absolute standard caused noticeably different results; yet after a constant technic was acquired we found the end reaction fairly easy to determine. In almost every case we could note a sharp change of color from yellow to reddish when the mixture of serum, acid, and indicator became acid, and this change could be appreciated when the acids used varied by one-half a dilution. For instance, if a mixture of serum, indicator, and say $\frac{N}{7.5}$ acid was still yellow, the next mixture of serum and $\frac{N}{7}$ acid would still be yellow, or would show a decided reddish tint. In a few cases, however, these changes were not so sharp. Therefore our actual results with the pipette method answer the *a priori* objections advanced in our preliminary report.[1]

[1] See the Bulletin of the Johns Hopkins Hospital, Nos. 195-196, June-July, 1907, p. 221.

The slight modifications in technic employed by us are probably sufficient to account for the difference in normal values obtained: Moore and Wilson's being $\frac{N}{5.5}$ to $\frac{N}{6}$: ours being $\frac{N}{6.5}$ to $\frac{N}{7}$. A better way to express our results would be in terms of sodium hydrate per 100 cc. of serum as is done in the Engel and in most other methods. This is simply accomplished. When we find that the alkalinity of the serum is $\frac{N}{7}$ sulphuric acid, we mean that a certain small portion of serum is neutralized by the same amount of $\frac{N}{7}$ acid. Presumably then 100 cc. of serum would be neutralized by 100 cc. $\frac{N}{7}$ acid, which is equivalent to 100 cc. NaOH. Therefore, to express the figure of alkalinity in terms of sodium hydrate all that is necessary is to give the actual amount of sodium hydrate in the specific normal solution, according to the following table:

N/5	Sulphuric	Acid	is	equivalent	to	400	mg.	NaOH	per	100	cc. serum.
N/5.5	"	"	"	"	"	363	"	"	"	"	"
N/6	"	"	"	"	"	333	"	"	"	"	"
N/6.5	"	"	"	"	"	307	"	"	"	"	"
N/7	"	"	"	"	"	285	"	"	"	"	"
N/7.5	"	"	"	"	"	266	"	"	"	"	"
N/8	"	"	"	"	"	250	"	"	"	"	"
N/8.5	"	"	"	"	"	235	"	"	"	"	"
N/9	"	"	"	"	"	222	"	"	"	"	"
N/9.5	"	"	"	"	"	210	"	"	"	"	"
N/10	"	"	"	"	"	200	"	"	"	"	"

Karfunkel, Lumière, Lumière and Barbier, have proved that the alkalinity does not increase proportionately to the amount of blood used. Thus these percentages would all be too high. Nevertheless they can be used for comparison with each other. Furthermore as almost all other clinical methods give figures based on similar calculations, they can also be used to compare with the results of other investigators.

The charts of results show that the neutralizable alkali of the blood serum as indicated by dimethylamidoazobenzol varies in different cases, that the variation is as a rule slight, and that it usually indicates a diminution. It is further apparent that in no disease is there a constant diminution, nor does the change seem to bear any very definite relation to the clinical picture. Studying the series of typhoid fever or pneumonia cases we see in some patients with signs of extreme intoxication normal alkalinity, whereas in others apparently less ill we have readings below normal. From these results it seems fair to draw one conclusion: Whatever these changes in the neutralizable alkali may mean, they are not specific for the underlying disease. When changes do occur they indicate a disturbance in the individual, most probably due to altered oxidation. This may depend on any one of a group of factors such as nutrition, the effect of fever on the concentration of the blood, or, what is most probable on some chemical change the nature of which is unknown to us. The changes in the neutralizable alkali may be compared to the urinary output, which varies in each case and depends in part on factors other than the disease itself. Gautrelet, basing his conclusions on biological studies, thinks that a direct relation exists between the alkalinity of the blood and "respiratory exchanges." The practice of averaging results in any disease for comparison

CHART 2.—NORMAL.

Case No.	Sex.	Color.	Age.	Date.	NaOH. Mg.	Remarks.
1.....	M.	W.	25	V, 6, 1907	307	
2.....	M.	W.	25	V, 20, 1907	285	
3.....	M.	W.	25	V, 24, 1907	307	
4.....	M.	W.	25	X, 19, 1907	285	
5.....	M.	W.	25	X, 24, 1907	285	
6.....	M.	W.	25	X, 25, 1907	285	
7.....	M.	W.	28	V, 10, 1907	285	
8.....	M.	W.	27	V, 19, 1907	285	
9.....	M.	W.	28	X, 18, 1907	285	
10.....	M.	W.	26	X, 18, 1907	266	One week before typhoid fever.
11.....	M.	W.	26	I, 15, 1908	307	After typhoid.
12.....	M.	W.	24	X, 19, 1907	307	
13.....	M.	W.	30	XI, 25, 1907	307	
14.....	M.	W.	32	I, 13, 1908	285	
15.....	M.	W.	34	I, 13, 1908	307	
16.....	M.	W.	24	I, 15, 1908	285	
17.....	M.	W.	26	I, 15, 1908	285	
18.....	M.	W.	24	I, 16, 1908	307	

These readings were made on healthy doctors, students and laboratory workers. They are all 285–307 mg. NaOH per 100 cc. serum except case 11. This man one week later developed a mild case of typhoid fever, and the low reading may have been due to the infection.

CHART 3.—TYPHOID FEVER.

Case No.	Sex.	Color.	Age.	Date.	NaOH. Mg.	Remarks.
1.....	M.	W.	26	V, 25, 1907	250	17th day. Soft diet. Temp. 101°.
2.....	M.	B.	24	X, 19, 1907	266	Paratyphoid; 63rd day. Soft diet. Temp. normal.
3.....	M.	W.	13	X, 25, 1907	235	43d day. Soft diet. Temp. 101°. } Same case.
4.....	M.	W.	13	XI, 29, 1907	285	78th day. Soft diet. Temp. 99°. } Same case.
5.....	M.	W.	13	XII, 18, 1907	333	98th day. Soft diet. Temp. 98.4°. } Same case.
6.....	M.	W.	23	XI, 25, 1907	307	19th day. Milk and albumen. Temp. 104°. } Same case.
7.....	M.	W.	23	XII, 9, 1907	250	30th day. Soft diet. Temp. 103°. } Same case.
8.....	M.	W.	23	I, 14, 1908	307	70th day. Soft diet. Temp. 98.4°. } Same case.
9.....	M.	B.	26	XI, 25, 1907	307	17th day. Soft diet. Temp. 101.5°.
10.....	M.	B.	19	XI, 27, 1907	307	20th day. Soft diet. Temp. 104°. Muscle twitchings. Very toxic.
11.....	M.	W.	25	X, 24, 1907	266	12th day. Milk & albumen. Temp. 103.5°. Extreme intoxication.
12.....	M.	W.	15	I, 15, 1908	266	43d day. Recrudescence. Temp. 102°. Soft diet.

These patients were all under observations in the wards. It is seen that there are no constant changes, and no close relation between changes in alkalinity and the clinical picture.

CHART 4.—PNEUMONIA.

Case No.	Sex.	Color.	Age.	Date.	NaOH. Mg.	Remarks.
1.....	M.	W.	42	V, 7, 1907	285	Secondary. Pulmonary embolism. Temp. 100°. Death.
2.....	M.	B.	18	V, 27, 1907	250	5th day. Very toxic. Temp. 104°. Recovery.
3.....	M.	W.	18	XI, 25, 1907	307	5th day. Temp. 102°. Recovery.
4.....	M.	B.	34	XI, 25, 1907	266	9th day. Temp. 98.6°. Recovery.
5.....	M.	W.	9	XII, 18, 1907	285	2d day. Temp. 103°. Recovery.
6.....	M.	W.	19	I, 2, 1908	307	3d day. Temp. 103.5°. Recovery.
7.....	M.	W.	30	I, 7, 1908	266	14th day. (?) Temp. 102°. Recovery.
8.....	M.	W.	66	I, 2, 1908	235	8th day. Temp. 101°. Chronic nephritis. Hb = 75%. Death.
9.....	M.	W.	60	I, 14, 1908	266	2d day. Temp. 102°. Terminal cardiac. Death.
10.....	M.	B.	26	I, 13, 1908	250	9th day. Temp. 103°. Death.
11.....	M.	C.	32	I, 13, 1908	266	16th day. Temp. 100°. } Same Case. Recovery.
	M.	C.	32	I, 16, 1908	285	19th day. Temp. 98.6°. } Same Case. Recovery.
12.....	M.	W.	16	I, 15, 1908	250	8th day. (?) Temp. 104°. Recovery.
13.....	M.	B.	24	I, 25, 1908	266	10th day. Temp. 102°. Death.

In this series the same inconstant variations are noted as in the typhoid fever patients.

CHART 5.—NEURASTHENIA.

Case No.	Sex.	Color.	Age.	Date.	NaOH. Mg.	Remarks.
1.....	M.	W.	32	V, 7, 1907	307	With hyperchlorhydria.
2.....	M.	W.	35	V, 8, 1907	307	
3.....	M.	W.	60	V, 25, 1907	307	With hypochlorhydria.
4.....	M.	W.	40	V, 25, 1907	307	Secondary to hyperthyreoidism.
5.....	M.	W.	41	XI, 29, 1907	307	
6.....	M.	W.	21	XII, 18, 1907	307	Hyperemesis. Gastric neurosis. Acetone in breath.

All the neurasthenics showed the high limit of normal. It is interesting that there is no difference in the readings in cases 1 and 3, one with hyperacidity of the gastric juice, one with subacidity. Case 4 was a mild latent case of hyperthyreoidism.

CHART 6.—DIABETES MELLITUS.

Case No.	Sex.	Color.	Age.	Date.	NaOH. Mg.	Remarks.
1.....	M.	W.	39	V, 26, 1907	235	Reading doubtful. Acetonuria.
2.....	F.	W.	60	V, 26, 1907	250	Acetonuria.
3.....	F.	B.	47	V, 10, 1907	266	No acetonuria. Also Cardio-renal.
	F.	B.	47	V, 27, 1907	266	" " " "
4.....	M.	W.	(?)	X, 25, 1907	307	Coma. Day before death.
5.....	F.	W.	42	I, 7, 1908	307	Acetonuria.

All these patients were receiving sodium-bicarbonate. The variations are certainly not constant. Case 4 is especially interesting in view of Benedict's results in diabetic coma.

CHART 7.—CHRONIC NEPHRITIS.

Case No.	Sex.	Color.	Age.	Date.	NaOH. Mg.	Remarks.
1.....	M.	W.	45	V, 6, 1907	266	Cardio-renal. Uræmia. Acetonuria.
2.....	F.	B.	47	V, 10, 1907	266	Also diabetes. Cardio-renal. Same case.
	F.	B.	47	V, 27, 1907	266	No acetonuria. No uræmia.
3.....	F.	W.	18	V, 20, 1907	285	Headache, nausea, vomiting.
4.....	F.	W.	20	XI, 27, 1907	285	Uræmic symptoms. Hb=55 %.
5.....	M.	B.	33	XI, 27, 1907	307	No uræmic symptoms.
6.....	F.	W.	22	XII, 3, 1907	285	Uræmic.
7.....	M.	W.	42	XII, 10, 1907	250	Cardio-renal; no uræmic symptoms.
	M.	W.	42	XII, 30, 1907	250	Same case, day before death.
8.....	M.	W.	42	XII, 10, 1907	266	Headache, blood-pressure 230; Hb=90 %.
9.....	M.	W.	58	XII, 10, 1907	307	Headache, dyspnœa, Hb=65 %.
10.....	M.	W.	59	XII, 10, 1907	266	Headache, drowsiness, dyspnœa, Hb=90 %.
11.....	M.	W.	22	XII, 30, 1907	285	Cardio-renal, day before death. Hæmoglobinæmia.
12.....	M.	W.	30	XII, 10, 1907	250	Also acute bronchitis. Temp. 99°. Hb=56 %.
13.....	M.	W.	66	I, 2, 1908	235	Also pneumonia, 8th day. Temp. 101°. Hb=75 %.

CHART 8.—MALIGNANT DISEASE.

Case No.	Sex.	Color.	Age.	Date.	NaOH. Mg.	Remarks.
1.....	M.	W.	49	I, 16, 1908	285	Epithelioma. Eyelid. Hb=75 %.
2.....	M.	W.	42	I, 16, 1908	307	Carcinoma, submaxillary.
3.....	F.	W.	52	V, 20, 1907	250	Carcinoma, stomach. Hb=72 %.
4.....	M.	W.	32	I, 16, 1908	285	Sarcoma, retroperitoneal. Hb=70 %.
5.....	M.	W.	23	X, 24, 1907	266	Sarcoma, testicle; retroperitoneal metastasis. Hb=60 %.

CHART 9.—CHRONIC DISEASES, WITH ANÆMIA.

Case No.	Sex.	Color.	Age.	Date.	NaOH. Mg.	Remarks.
1.....	M.	B.	66	X, 19, 1907	235	Cirrhosis of liver, luetic (?) No cholæmia.
	M.	B.	66	XI, 27, 1907	250	Hb=60 %.
	M.	B.	66	XII, 3, 1907	250	
2.....	M.	W.	53	XII, 18, 1907	266	Splenomegaly. Scleræ jaundiced. Hb=68 %.
3.....	M.	W.	44	V, 10, 1907	266	Pernicious anæmia (primary) Hb=48 %.
4.....	F.	W.	36	V, 20, 1907	235	Cholelithiasis. Cholæmia. Hb=15 %.
5...	M.	W.	26	X, 24, 1907	250	Double tertian malaria. Hb=32 %.
6.....	M.	W.	20	XI, 29, 1907	285	Amœbic dysentery. Tonsillectomy. Hb=56 %.
7.....	M.	W.	51	V, 30, 1907	250	Scurvy. Subcutaneous hæmatomata.
	M.	W.	51	V, 31, 1907	250	Hb=45 %.

In charts 7, 8, 9 it is seen that the effect of the blood count on the neutralizable alkali of the serum is by no means constant.

CHART 10.—MISCELLANEOUS.

Case No.	Sex.	Color.	Age.	Date.	NaOH. Mg.	Remarks.
61.....	M.	W.	39	XI, 29, 1907	307	Myocarditis.
62.....	M.	W.	45	I, 2, 1908	307	Delirium Tremens. Acute bronchitis. Temp. 101.5°.
55.....	M.	W.	10	V, 6, 1907	307	Pulmonary tuberculosis.
55.....	M.	W.	10	V, 7, 1907	307	
56.....	M.	W.	6	V, 8, 1907	250	Pulmonary abscess. Death.
56.....	M.	W.	6	V, 25, 1907	235	
57.....	M.	B.	31	V, 27, 1907	266	Tuberculous pleurisy and peritonitis.
58.....	M.	W.	48	V, 19, 1907	266	Pulmonary tuberculosis. Acetone in breath.
59.....	F.	W.	15	XII, 3, 1907	285	Acute arthritis. Temp. 102.5°.
59.....	F.	W.	15	I, 14, 1908	307	Same case. Temp. 98.4°.
76.....	M.	W.	11	I, 14, 1908	266	Acute arthritis.
77.....	M.	W.	15	I, 14, 1908	266	Ulcerative endocarditis. Temp. 100°.
78.....	F.	B.	32	I, 13, 1908	250	Endocarditis, purpura. Hb=70 %. Day of death.
60.....	M.	W.	24	XI, 29, 1907	266	Polycythæmia. R.B.C. 6,700,000. Hb=95 %.
43.....	M.	B.	38	XI, 27, 1907	307	Erysipelas. Abscess of axilla. Temp. 104°.

with normal does not perhaps give a just picture of the variations which may be presented in a detailed study of the individual: still it is patent from our observations that although the individual variations may be greater than is indicated in general averages, yet these so far have not shown any positive correlation to the clinical picture.

In explaining the great discordance in results of hæmalkalimetrical studies in the literature, the inherent physical and chemical difficulties, and the variations in technic must be considered of the greatest importance, but they *per se* can hardly be the only causes. The study of the original contributions, of which Drouin's thesis is an example, impresses one with two facts: first, in many instances only a few cases have been studied, and second, little or no information is given regarding the condition of the patient, his nutrition, his blood, stage of disease, etc. In other words, the deductions as to alkalinity changes in disease have been based on cases insufficient in number, and in which too little attention is paid to other conditions probably more important than the underlying disease. If, as we think, changes in the alkalinity are not specific for a disease then the name of the disease is of less importance than the general condition of the patient, and any factors which may tend to disturb the metabolism should be carefully studied. Bearing this point of view in mind we can easily conceive how a series of a few cases of typhoid fever for instance, which may happen to show reduced alkalinity at the time the blood was studied, might lead an investigator to conclude that in typhoid the alkalinity is reduced, whereas if he had studied a larger series he might have found certain cases reduced, and others normal as in our series.

SUMMARY.

Remembering the limitations of clinical methods we should be satisfied if the results of any such method of hæmalkalimetry had aided the internist in diagnosis, prognosis, or therapy; but so far all methods have been devoid of even empirical value. Further until the time comes when we have a definite knowledge of the causes underlying relatively slight variations in the neutralizable alkali we can hope for little of practical interest from these observations.

In conclusion I wish to express my thanks to Dr. L. F. Barker for the privilege of studying the cases in the wards of the Johns Hopkins Hospital, to Dr. Carl Voegtlin for many helpful suggestions, and to Dr. Thomas R. Boggs, under whose direction this work was begun and whose assistance and encouragement alone made its completion possible.

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CARDIOHEPATIC ANGLE.

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In 1878, Rotch (1) showed that in the early stages of pericardial effusions the fluid collected in the lower portion of the sac, especially at the right border of the sternum. Dulness in the fifth interspace at the right border of the sternum was mentioned as the first sign of pericardial effusion.

Based on Rotch's observations, and his own series of clinical cases, Ebstein (2), in 1892, came to the same conclusion as Rotch; and designated the angle formed by the right border of heart dulness and the upper border of liver dulness the "cardiohepatic angle." Normally, this angle is a right-angle; but, obtuse in pericarditis, due to displacement of the lung to the right. It is generally conceded that enlargements of the heart rarely displace the anterior border of the lung sufficiently to give an appreciable area of absolute dulness at the right border of the sternum, *B* in Fig. 1, and almost never in the fifth interspace. Absolute dulness one centimetre wide at

the right border of the sternum is perhaps the maximum, except in mitral stenosis in which the texts say that dulness may be five centimetres to the right of the right border of the sternum. The absence of this area of dulness in enlargement of the heart and its presence in pericarditis was especially emphasized by Ebstein, and later by others.

The anterior projections of two cases of pericarditis, shown in Fig. 1, show the increase in the cardiohepatic angle which may be explained as follows:

When the pericardium is distended the entire right wall, from its attachments to the large vessels above to the diaphragm below, is displaced outward; and the diaphragm with its attachment to the right wall of the pericardium is displaced downward. This uniform displacement of the right wall of the pericardium displaces the lung outward from its root down to the diaphragm; and may also displace the root of the lung.

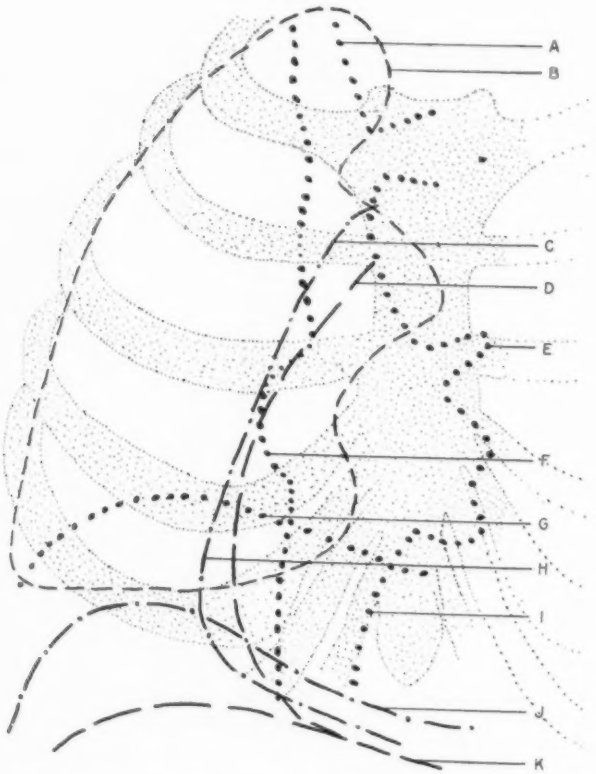

FIG. 1.—Here the front projection of an enlarged heart due to aortic stenosis is shown. Apex is beyond the anterior-axillary line. Heart is 6½ inches in transverse diameter. The right wall and diaphragm of two cases of pericarditis are also shown. *A* represents the jugular vein, its continuation the superior cava; *B*, the anterior median border of right lung; *C*, right wall of pericardium with *J*, its corresponding diaphragm, of one case of pericarditis; *D*, right wall of pericardium with *K*, its corresponding diaphragm, of second case of pericarditis; *E*, left wall of right auricle; *F*, right wall of right auricle; *G*, diaphragm of heart case; *H*, lower portion of pericardial wall showing point of maximum displacement; *I*, inferior cava.

As the root of the lung is displaced the anterior margin of the lung must go outward and upward, carrying with it the lower portion of the median border and angle of the lung. Or the displacement of the root of the lung causes a general displacement of the lung and accounts for a portion of the displacement of the lung at the lower right border of the sternum.

The downward displacement of the attachment of the right wall of the pericardium to the diaphragm permits that portion of the right wall of the pericardium which is most displaced to occupy a lower position than displacements of the right wall of the pericardium due to enlargement of the heart.

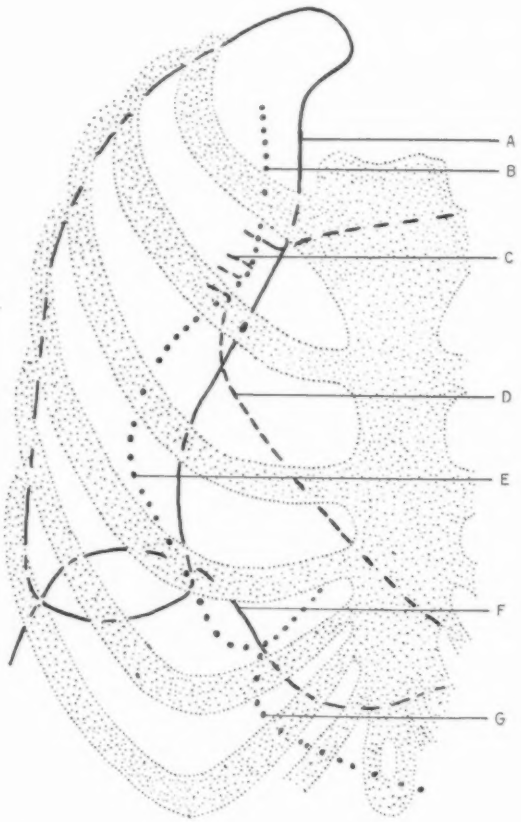

FIG. 2.—Anterior projection of a case of mitral stenosis. *A* represents the anterior median border of the right lung; *B*, the right wall of the superior cava which is continued downward as the right wall of the right auricle; *C*, pulmonic veins; *D*, right wall of the left auricle; *E*, right auricle; *F*, diaphragm; and *G*, right ventricle.

Compare in Fig. 1, *H* with *F* and with *E* in Fig. 2. The lowest position of the greatest displacement of the right wall is most favorable to the greatest displacement of the lower portion of the lung.

In pericarditis three factors are present to cause the dislocation of the lung:

1. Possible displacement of the root of the lung.

2. Pressure of the pericardium on the lung from its root to lower border.

3. Downward displacement of the attachment of the right wall of the pericardium to the diaphragm, thereby lowering the point of greatest displacement of the right wall of the pericardium.

In enlargement of the heart these factors are usually absent. Fig. 1, *H*, shows an anterior projection of a very large heart.

Fig. 2, shows an anterior projection of the right wall of the right auricle, right lung, and left auricle, of a case of mitral stenosis. The large area of absolute dulness to the right of the sternum and the great increase in the cardiohepatic angle are certainly exceptional and are due to mechanical effects somewhat different from those just described. Here the dilatation of the left auricle has displaced the root of the lung outward and upward, as shown in Fig. 2, *C*, which represents the location of the pulmonary veins. This displacement pulls the lower angle of the lung outward and upward. The dilated right auricle lying inferior to the root of the lung pushes the lower portion of the lung outward.

In enlargement of the heart and pericarditis two factors are necessary to materially increase the cardiohepatic angle:

1. Displacement of the root of the lung; either to the right; to the right and upward; to the right, upward, and backward; or backward and upward.

2. Displacement of the lower portion of the right wall of the pericardium, either by effusion or by very large dilatation of the right auricle.

The presence or absence of a decided increase in the cardiohepatic angle depends on the degree of development of factors 1 and 2. If factor 1 is absent, the area of absolute dulness to the right of the sternum will be minimum, for the reason that the displacement of the lung is local which can in a measure be compensated by the elasticity of the portion of the lung affected, Fig. 1, *F* and *B*. This is the usual finding in enlargement of the heart. Dilatation of the left auricle, giving factor 1, in the absence of dilatation of the right auricle, may cause only slight increase in the area of dulness to the right of the sternum. But the way is prepared for the lung, when the right auricle dilates, to slip, as it were, behind and above the heart, as shown in Fig. 2.

Clinically, the value of the cardiohepatic angle in pericarditis is not decreased in the early stages of the development of dilatation of the left auricle, because the signs of the mitral lesion would be present. In enlarged hearts the lesion must be determined before an increased cardiohepatic angle is differential for an associated pericardial effusion. In extreme dilatation of the heart, when differentiation from pericarditis is the most difficult, the cardiohepatic angle is of little value, unless the history of the case is known; even then it is, at best, uncertain. When pericardial effusion can be positively excluded, an increase in the cardiohepatic angle becomes a sign of mitral stenosis, because this lesion most frequently causes extensive dilatation of the left auricle and displacement of the root of the lung. When the history of the case is known, allowing heart lesions to be excluded, an increase in the cardiohepatic angle retains the value in pericarditis with effusion given to it by Ebstein and others.

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PROCEEDINGS OF SOCIETIES.

THE JOHNS HOPKINS MEDICAL SOCIETY.

February 3, 1908.

Meeting of the Johns Hopkins Hospital Medical Society, Dr. Finney presiding.

I. Exhibition of a Case of Combined Organic and Hysterical Paralysis. DR. THOMAS.

The patient, a male, a German immigrant who has been in this country two months, came to the dispensary 10 days ago complaining of numbness of the left arm. He said that two or three days before coming to the hospital, at three o'clock in the morning, he was awakened from a dream in which he saw his father, who had been dead for two years, come into his room and fire a pistol at him. He woke up and found his arm absolutely paralyzed.

Physical examination revealed total paralysis of the left arm, from the elbow down. In the distribution of the radial nerve, his hand felt numb. There was absolute anæsthesia all over the hand and up the arm as far as the elbow. The psychical shock, the great extent of the paralysis and the marked anæsthesia made the case look like one of hysteria; however in flexing the arm, which he did with nearly normal strength, it was found that the supinator longus did not act. It seemed so unlikely for hysteria to have paralysed one muscle in a group without any involvement of the others that a more probable explanation was that the patient had slept on his arm and the pressure made it numb, that the numbness induced the dream, and that on waking up and finding his arm numb, a hysterical paralysis occurred in addition to the organic musculo-spiral paralysis.

This case illustrated, in the author's opinion, the importance of always being on the lookout for organic lesions in a hysterical patient. It also exhibited some of the differences between an organic and hysterical paralysis.

An organic paralysis is due to a more or less permanent alteration somewhere in the nervous tissues: here it was a lesion of the musculo-spiral nerve caused by pressure during sleep. A hysterical paralysis, however, may follow psychical

shock: in this instance the dream was the exciting agent. As regards the distribution of the paralysis, an organic lesion involves muscles or movement in accordance with their localization in the nervous system, while a hysterical paralysis is not based on anatomical boundaries. This patient's hysterical paralysis involved all the movements of the wrist and hand, but the fact that the supinator longus would not act during flexion of the elbow revealed the organic element, for it was hard to understand as hysterical a paralysis that picked out a single muscle from a group that acts together as a functional unit.

The subsequent course of events served to substantiate the early diagnosis, for following strong suggestion, the sensory loss had entirely disappeared, and the paralysis, except of those muscles supplied by the musculo-spiral nerve had largely cleared up within a few days.

II. Exhibition of Pathological-Surgical Specimens. Dr. Bloodgood.

Dr. Bloodgood gave a lantern demonstration of photographs and paintings of several rare cystic tumors of the thigh. The tumors included lymph cysts, blood cysts, and a few due to healed tuberculous cavities. Most of these appeared in the region of Scarpa's triangle. One was a cyst that resulted from a bursitis of the bursa covering an exostosis that arose from the great trochanter of the femur.

Discussion.

Dr. Finney.—Two or three weeks ago we operated on a cyst of the neck that was an example of a serous cyst with hæmorrhagic contents. It was a purely traumatic affair, though we found no particular vessel feeding it. It was just over the thoracic duct.

I can recall two cysts of the groin. One patient that I have seen off and on for 15 years has come to my office within the last two weeks. This patient had had the cyst for 30 years. Following a slight injury recently the cyst suddenly increased in size and became painful. With rest it has become pretty well again. In another case, in a woman, I thought the contents were probably bloody because by transmitted light the color was very dark. Since the tumor gave no particular trouble the patient would not allow treatment, not even aspiration.

Some of the cysts do not interfere with the patient's comfort and are to be removed only when some definite indication arises.

Dr. Hurd.—I recall that the late pope, Leo XIII, when nearly 90 years old had a cystic tumor removed from his thigh. Up to that time it had given him very little trouble.

Dr. Bloodgood.—About 10 or 12 years ago I was asked to see a cyst of the groin of three years' duration. The patient, a woman, insisted on operation. At that time we didn't know so much about the ligation of blood vessels, and were disinclined to operate because we feared gangrene might result if the femoral artery were tied. The cyst was about the size of an orange, distinctly capsulated, and rested between the femoral artery and vein. We aspirated it and cauterized the lining. Just at that moment, blood welled out from the bottom almost as rapidly as though I had cut the femoral. I was anxious not to injure the vein, so I packed the cyst. The cyst leaked blood every now and then. The patient lived about five years and finally died of a secondary anæmia.

III. Enteritis with Meningeal Symptoms Followed by Multiple Neuritis. Dr. McCarty.

The speaker reported the history of a male child, aged 5 years, who had developed a definite and typical attack of meningitis. The symptoms continued for almost a month, when on account of the character of the stools which were foul smelling and contained much mucus, undigested food, and occasional streaks of blood, it was thought that the meningeal symptoms might be due to the action of toxins absorbed from the intestinal tract. Treatment was instituted from this point of view and improvement was immediate and rapid. As the symptoms of meningeal irritation cleared up, it became evident that there was a symmetrical paralysis of the legs. A definite peripheral neuritis of the lower extremities developed. The author thought that here the neuritis was also dependent on the circulating toxin which arose from the intestinal tract.

Discussion.

Dr. Cole.—This report of Dr. McCarty's brings to mind a case of intestinal intoxication with symptoms simulating a cerebral lesion, which was in the hospital some years ago. This child had unilateral convulsions. The illness cleared up with treatment directed toward the intestinal condition.

IV. Report of Gynæcological Cases. Dr. Cullen.

Dr. Cullen exhibited the gross specimen of a tumor that had been diagnosed clinically as a carcinoma of the cervex uteri. Anatomically it was a carcinoma of the body of the uterus with secondary implication of the cervix. The growth had extended through the uterus and involved the walls of two intestinal loops.

He also reported a recent case where there had been a primary carcinoma of the right ovary with secondary involvement of the left ovary; and in addition, the patient also had a primary carcinoma of the body of the uterus.

The third case reported was found to have an adenomyoma of the body of the uterus, abscess of the left Fallopian tube, primary carcinoma of the left ovary and primary carcinoma of the uterus.

The speaker discussed possible accidents that can result from draining through the vaginal vault. He stated that many gynæcologists have had deaths occur which were directly due to draining through this region; and reported one instance where the forceps had been introduced through the bladder and urethra instead of through the vagina, and another in which the forceps were carried up through the rectum. In both of these latter cases the mistake was discovered in time and the patient's life saved. The moral is that in every case the forceps should be introduced under sight.

In a case of simple perineal operation, on the fourteenth day following operation, the entire wound tore out after a constipated movement. Anæmia was probably the reason for the failure of the wound to heal. The patient recovered after a second operation.

A patient, whom the author saw recently, suffered an extremely serious hæmorrhage from the vagina after an accident in which she fell across a chair. No lesion was to be made out in the vagina, but just inside the labium was a very small clot which upon being squeezed emitted a tremendous spurt of blood.

Dr. Cullen also reported the case of a girl, aged 17 years, who had never menstruated. Examination revealed the entire absence of the vagina and the presence of a hard mass in the left side of the pelvis. At operation it was found that the distance between the bladder and rectum was only 2 mm. Both tubes and ovaries were in the inguinal canals. There was no uterus. The mass was extra-peritoneal and was found to be the right kidney, of twice normal size, lying in the pelvis. No trace of the left kidney was to be found.

V. A Case of Influenzal Meningitis. DR. COHOE.

D. R., a male, aged 36 years, was admitted to the hospital complaining of retention of urine, headache and backache. Two weeks before admission the patient had been struck over the left ear by a beer bottle, inflicting a scalp wound, following which he had remained in bed on account of dizziness and a cold in the head. On examination in the hospital, meningeal symptoms were found present. There was marked stiffness of the cervical muscles, a slight external strabismus of the right eye, and a very distinct Kernig's sign on both sides. The knees were kept flexed. A crop of herpes was noted at the angle of the mouth. The heart, lungs and abdomen were negative. The temperature on admission was 103° and pulse 80. For about eight days a fastigium of from 100-104° was maintained, after which the temperature assumed an amphibolous phase, becoming normal on the 15th day. The pulse was slow during the entire disease, frequently falling as low as 50. The respirations were normal throughout. An aural examination revealed a chronic otitis media of both ears. The eye examination showed both discs to be hyperæmic, œdematous and swollen. The pupils were equal and reacted to light and accommodation. The leucocytes on admission were 9000, rising slowly after four days to 13,000 and falling again to 10,000 on the first day of normal temperature. The blood pressure remained slightly below normal. The urine on admission showed a trace of albumen and a few hyaline and granular casts. There was retention of urine during the early days of the disease.

The patient, during the acute stage, was extremely restless, with alternating periods of stupor and delirium. Both meningeal and psychical symptoms gradually ameliorated and the patient left the hospital well in five weeks.

Lumbar puncture was performed three times. The fluid in each case was under high pressure, 250-400 mm., and slightly turbid. The cell content was found greatly increased, 1500 cells per cm., 87 per cent of which were polymorphonuclears. An examination of smears, stained with dilute carbolfuchsin, showed the presence of a few small, thick bacilli in a field, some of which were extracellular, and others intracellular. In the fluid from the third puncture the majority of organisms were found to be intracellular. Cultures of the fluid on blood agar gave a delicate growth of pin point, translucent, discrete colonies, of dewdrop appearance, in pure culture. Cultures on other media remained sterile. Subcultures grew only on hæmoglobin-containing media, best on pigeon's blood agar. Morphologically the organism was a short, thick, non-motile bacillus. It was Gram negative, staining best with dilute watery carbolfuchsin, and well with Bismark brown. The bacillus conformed in every respect biologically and morphologically with the B. influenzæ. Two blood cultures were made from the blood of the patient, both of which were negative. The serum of the patient was found not to contain specific agglutinins for the organism, and animal inoculation with the organism was without result.

February 17, 1908.

Meeting of Johns Hopkins Hospital Medical Society, Dr. Finney presiding.

I. Exhibition of Cases. Facial Paralysis Following Otitis Media. DR. REIK.

The speaker prefaced his remarks by recalling the fact that in December, 1901, he had discussed before the society the occurrence of so-called refrigeratory facial paralysis as a complication of certain cases of non-suppurative otitis media. At that time, in taking up the pathology of the affection, he was convinced that in the majority, if not in all, cases of this refrigeratory paralysis, an acute or subacute otitis media is an intermediate factor between exposure to cold and the paralysis. Statistics that include all cases of facial paralysis would indicate that from 2 to 4 per cent were due to trauma, from 2 to 4 per cent to lues and about 70 per cent to exposure to cold. The speaker thought that exposure to cold produces an otitis media, and in cases when the facial nerve is exposed in the tympanic cavity, there occurs pressure on the nerve or a direct extension of the infection to the nerve, either of which agents may give rise to the palsy. All three cases, when the nerve was examined microscopically, showed the existence of a pressure paralysis; there was a parenchymatous and not an interstitial change.

In the past few years Dr. Reik has never failed to find some affection of the middle ear in all cases of this palsy. In making a study of temporal bones, he noted that in one-half of all normal bones, the facial nerve is exposed in the inner wall of the tympanic cavity. In all other regions the facial nerve is very well protected.

The ordinary history of these cases is that of a patient who after exposure develops an acute otitis media, associated with a slight cold. He goes to bed, feeling pain in the ear and wakes up the next morning with distortion of the face.

The case exhibited was that of a man, who came to the dispensary on February 5, complaining of discomfort in the left ear, stiffness, mild pain and deafness. He had an acute

catarrhal otitis media without bulging. On February 7, he was better and felt no pain, but there were still marked congestion and evidences of exudate. On February 14, he returned to the dispensary and said he had felt better for a few days, but that on February 13, he had suffered an increase of his symptoms and woke up the next morning with a facial paralysis. Examination revealed a bulging tympanic membrane, and paracentesis allowed the escape of a sterile secretion. Following the paracentesis his condition improved immediately, and 72 hours after the operation, except for a little weakness of his muscles, he had almost completely recovered from his paralysis.

Recovery is generally slow without treatment. After paracentesis it is almost immediate and rapid. As an aid to diagnosis of the ear condition, the hearing should always be tested.

Discussion.

Dr. Cushing.—I should like to ask Dr. Reik whether he has observed auricular herpes in any of these cases.

Dr. Reik.—I have not personally seen it, but I have heard of its occurrence.

Dr. Cushing.—It is very difficult for one to see how a little pressure can cause facial paralysis. There have been a number of cases of facial palsy reported in which there has been a lesion of the posterior geniculate ganglion and they do not have to have an outcrop of herpes. I have been inclined to think that some of these cases might be due to an affection of the geniculate ganglion.

II. Standards of Medical Education in this Country. Dr. Bevan, Chicago, Ill.

A summary will appear later.

NOTES AND NEWS.

THE CENTRAL COMMITTEE OF THE INTERNATIONAL CONGRESS ON TUBERCULOSIS HAS ANNOUNCED THE OFFER OF THE FOLLOWING PRIZES:

I. A prize of $1000 is offered for the best evidence of effective work in the prevention or relief of tuberculosis by any voluntary Association since the last International Congress in 1905. In addition to the prize of $1000, two gold medals and three silver medals will be awarded. The prize and medals will be accompanied by diplomas or certificates of award.

Evidence is to include all forms of printed matter, educational leaflets, etc.; report showing increase of membership, organization, classes reached—such as labor unions, schools, churches, etc.; lectures given; influence in stimulating local Boards of Health, schools, dispensaries, hospitals for the care of tuberculosis; newspaper clippings of meetings held; methods of raising money; method of keeping accounts.

Each competitor must present a brief or report in printed form. No formal announcement of intention to compete is required.

II. A prize of $1000 is offered for the best exhibit of an existing sanatorium for the treatment of curable cases of tuberculosis among the working classes. In addition to the prize of $1000, two gold medals and three silver medals will be awarded. The prize and medals will be accompanied by diplomas or certificates of award.

The exhibit must show in detail construction, equipment, management, and results obtained. Each competitor must present a brief or report in printed form.

III. A prize of $1000 is offered for the best exhibit of a furnished house, for a family or group of families of the working class, designed in the interest of the crusade against tuberculosis. In addition to the prize of $1000, two gold medals and three silver medals will be awarded. The prize and medals will be accompanied by diplomas or certificates of award. This prize is designed to stimulate efforts towards securing a maximum of sunlight, ventilation, proper heating, and general sanitary arrangement for an inexpensive home. A model of house and furnishing is required. Each competitor must present a brief with drawings, specifications, estimates, etc., with an explanation of points of special excellence. Entry may be made under competitor's own name.

IV. A prize of $1000 is offered for the best exhibit of a dispensary or kindred institution for the treatment of the tuberculous poor. In addition to the prize of $1000, two gold medals and three silver medals will be awarded. The prize and medals will be accompanied by diplomas or certificates of award.

The exhibit must show in detail construction, equipment, management, and results obtained. Each competitor must present a brief or report in printed form.

V. A prize of $1000 is offered for the best exhibit of a hospital for the treatment of advanced pulmonary tuberculosis. In addition to the prize of $1000, two gold medals and three silver medals will be awarded. The prize and medals will be accompanied by diplomas or certificates of award.

The exhibit must show in detail construction, equipment, management, and results obtained. Each competitor must present a brief or report in printed form.

VI. The Hodgkins Fund Prize of $1500 is offered by the Smithsonian Institution for the best treatise that may be submitted on "The Relation of Atmospheric Air to Tuberculosis."

The detailed definition of this prize may be obtained from the Secretary-General of the International Congress or Secretary of the Smithsonian Institution, Chas. D. Walcott.

VII. Prizes for Educational Leaflets:

A prize of $100 is offered for the best educational leaflet submitted in each of the seven classes defined below. In addition to the prize of $100, a gold medal and two silver medals will be awarded in each class. Each prize and medal will be accompanied by a diploma or certificate of award.

Competitors must be entered under assumed names.

A. For adults generally (not to exceed 1000 words).
B. For teachers (not to exceed 2000 words).
C. For mothers (not to exceed 1000 words).
D. For in-door workers (not to exceed 1000 words).
E. For dairy farmers (not to exceed 1000 words).
F. For school children in grammar school grades (not to exceed 500 words).

In classes A, B, C, D, E, and F, brevity of statement without sacrifice of clearness will be of weight in awarding. All leaflets entered must be printed in the form they are designed to take.

G. Pictorial booklet for school children in primary grades and for the nursery.

Class G is designed to produce an artistic picture-book for children, extolling the value of fresh air, sunlight, cleanliness, etc., and showing contrasting conditions.

"Slovenly Peter" has been suggested as a possible type. Entry may be made in the form of original designs without printing.

VIII. A gold medal and two silver medals are offered for the best exhibits sent in by any State of the United States, illustrating effective organization for the restriction of tuberculosis. Each medal will be accompanied by a diploma or certificate of award.

IX. A gold medal and two silver medals are offered for the best exhibits sent in by any State or Country (the United States excluded), illustrating effective organization for the restriction of tuberculosis. Each medal will be accompanied by a diploma or certificate of award.

X. A gold medal and two silver medals are offered for each of the following exhibits; each medal will be accompanied by a diploma or certificate of award; wherever possible each competitor is required to file a brief or printed report:

A. For the best contribution to the pathological exhibit.

B. For the best exhibit of laws and ordinances in force June 1, 1908, for the prevention of tuberculosis by any State of the United States. Brief required.

C. For the best exhibit of laws and ordinances in force June 1, 1908, for the prevention of tuberculosis by any State or Country (the United States excluded). Brief required.

D. For the best exhibit of laws and ordinances in force June 1, 1908, for the prevention of tuberculosis by any municipality in the world. Brief required.

E. For the society engaged in the crusade against tuberculosis having the largest membership in relation to population. Brief required.

F. For the plans which have been proven best for raising money for the crusade against tuberculosis. Brief required.

G. For the best exhibit of a passenger railway car in the interest of the crusade against tuberculosis. Brief required.

H. For the best plans for employment for arrested cases of tuberculosis. Brief required.

XI. Prizes of two gold medals and three silver medals will be awarded for the best exhibit of a workshop or factory in the interest of the crusade against tuberculosis. These medals will be accompanied by diplomas or certificates of award.

The exhibit must show in detail construction, equipment, management, and results obtained. Each competitor must present a brief or report in printed form.

The following constitute the Committee on Prizes:

DR. CHARLES J. HATFIELD, Philadelphia, *Chairman.*
DR. THOMAS G. ASHTON, Philadelphia, *Secretary.*
DR. EDWARD R. BALDWIN, Saranac Lake.
DR. SHERMAN G. BONNEY, Denver.
DR. JOHN L. DAWSON, Charleston, S. C.
DR. H. B. FAVILL, Chicago.
DR. JOHN B. HAWES, 2D, Boston.
DR. H. D. HOLTON, Brattleboro.
DR. E. C. LEVY, Richmond, Va.
DR. CHARLES L. MINOR, Ashville, N. C.
DR. ESTES NICHOLS, Augusta, Me.
DR. M. J. ROSENAU, Washington.
DR. J. MADISON TAYLOR, Philadelphia.
DR. WILLIAM S. THAYER, Baltimore.
DR. LOUIS M. WARFIELD, St. Louis.

NOTES ON NEW BOOKS.

Text-Book of Ophthalmology. By DR. ERNST FUCHS. Translated by ALEXANDER DUANE, M. D. Third edition. (*Philadelphia: J. B. Lippincott & Co., 1908.*)

Although it has been several years since the last edition of Duane's translation of Professor Fuchs' Text-Book of Ophthalmology appeared, yet up to the present time it has been quite rightly regarded as the best text-book on ophthalmology in English.

The progress of time, however, has brought with it new ideas in pathology and treatment, and these have been incorporated in the volume which we now have before us. The book covers the subject of ophthalmology in such a clear, thorough, and complete fashion that one unconsciously realizes that it is the work of a master. The book is thorough and complete, and yet it is written with so much conservatism that it is especially well adapted to the needs of the beginner in ophthalmology, as well as of the more advanced worker. The anatomy and pathology of the eye are thoroughly gone into and the discussion of the various diseases (and lesions) of the eye is so complete and accurate that we have practically a perfect text-book of ophthalmology, which is most satisfactorily adapted to the needs of the student of medicine, general practitioner, or specialist.

As in the previous edition, Dr. Duane, the translator and editor, has added many valuable comments which the American reader will much appreciate.

This text-book deserves to rank as a great modern medical classic and Professor Fuchs has, through the efficient and able editorship of Dr. Duane, put at the disposal of the medical reading public in America a peerless text-book on the subject of ophthalmology.

B. B. BROWNE, JR.

A Text-Book of Physiology. By ISAAC OTT, A. M., M. D., Professor of Physiology in the Medico-Chirurgical College of Philadelphia, etc. Second edition, revised and enlarged. (*Philadelphia: F. A. Davis Company, Publishers, 1907.*)

There are two factors upon which depend the value of a review. In the first place, there is the reviewer's knowledge of the subject, and in the second place, his acquaintance with the book reviewed. The first factor is indicated by the signature which follows the review; the second is the reviewer's own secret. The reader is, of course, interested in the opinion of the reviewer but would like mightily to know upon what that opinion is based, and, since it is only fair to him and to the author of the book reviewed, I shall say at once that I have read with great care the chapter on the circulation, that part of the chapter on the respiration most likely to be wrong, and have merely glanced at the rest of the book.

The defence of Archias being easy, Cicero spends his time in the praise of letters, and similarly, finding the text-book in question very vulnerable, I prefer to write on physiological text-books in general, while illustrating my points by means of this one in particular.

There is, perhaps, nothing which indicates our over-specialization so clearly as the inability of most scientists to write English. It is true that orthography may be left to the proof-reader, but to neglect Grammar, Logic, and Rhetoric (Lucidity's three handmaidens) is really a serious matter. A few examples will make this point clear.

Bad grammar. I. "If, now, there be a flow of the liquid it will be because of a difference of pressure at the reservoir and

the outlet due to gravitation" (p. 265). That which is due to gravitation is the pressure not the difference in pressure.

Unusual diction. I. The blood-pressure may be raised by "the heart beating more vigorously and more completely and sending more blood into the aorta at each beat" (p. 271). Can the student be expected to know that "a completely beating heart" is one which is emptying itself completely? II. "An isotonic solution (0.7% NaCl) is necessary to keep the heart beating; but to keep the contractions going, calcium must be added, ... " (p. 245). Is there any obvious difference between "keep beating" and "keep going" in the sentence just quoted?

Carelessness of expression. I. "This [the pulse] wave is not an actual movement of the particles of the blood but a transmission of the impulsion of the heart throughout the length of the arterial tree" (p. 255). By "actual movement" is here meant a movement of translation as contrasted with an oscillatory movement. II. "The resistance which the blood meets with in the more or less shrunken vessels is generally designated by the misnomer *friction*" (p. 274). By "friction" is here meant external friction as contrasted with internal friction, which is the real cause of the resistance.

Bad logic. I. "Because of the considerable amount of muscular and elastic fibers present in the walls of the arteries, they (unlike the veins) are usually found empty and dilated after death" (p. 246). One might as well say "Because I have legs I run before breakfast." To be sure, if I had no legs I could not run at all, but would the possession of legs be regarded as a sufficient explanation of the phenomenon mentioned? II. "The total capacity of the capillaries is about three hundred times that of the arteries, so that in them much of the blood-pressure is lost, ... " (p. 249). By the same logic, the capacity of a steam boiler is three hundred times that of the gauge pipe, therefore the pressure is lower in the boiler than in the gauge pipe.

Over-condensation. I. [1] "Even after curarization, irritation of the central end of the depressor lowers the arterial tension. [2] If the splanchnics are previously divided, stimulation of the depressor has hardly any effect. [3] After an injection of pyocyanin, which paralyses the vasodilator centers, irritation of the depressor does not lower the arterial tension. [4] Porter and Beyer have shown that it dilates the arterioles throughout the body, and especially the blood-vessels innervated by the splanchnics" (pp. 238-9). To the thoughtful student this suggests only a series of questions. If [3] is true how is it that [2] is true, seeing that the splanchnics are poor in dilators? What is the significance of [1]? If [2] is true has [4] any importance at all? Now is it good pedagogics to present such an incomplete picture to the student?

Agglutination. By this I mean the stringing together of a lot of more or less disconnected statements, a style admissible in the book of proverbs but not to be encouraged in text-books. As an example of this we have the passage already cited under the heading "Over-condensation."

Apart from the English there are some other defects to be found to a greater or less extent in all text-books. They are the following:

All text-books are more or less behind the times. In the case of physiology, this is not remarkable for the field is so enormous. We expect to find in every writer of a text-book a certain amount of unfamiliarity with some of the most recent literature. It is not well, however, to demand of the student too much indulgence as in the examples to be given.

I. "By reason of this blood-distension the auricles become excited to contract. The blood is rushed into the ventricles, dilating them to their maximum. From distension produced in them and also from the ganglionic impulses which were not efficacious except at this moment, the ventricles are made to contract in their turn" (p. 230). II. "When the accelerator fibers are divided, the rhythm of the heart remains unchanged. This proves that the accelerator center is not constantly in a state of tonic excitement" (p. 241). This statement is not in accord with the work of Hunt published in 1897. III. ". . . . in the vagus we have fibers of two kinds: one calling out expiration when an ordinary inspiration of air is made, the other calling out inspiration when an ordinary expiration is made. So that every act of inspiration calls out an expiration and every act of expiration calls out an inspiration" (p. 333). This is the old Hering-Breuer theory. Since that theory was put forth the work of Gad, Lewandowski, Boruttau, Head, Schenck, and finally Alcock and Seeman has added much to our knowledge of this subject. The latter may be summed up as follows: 1. The normal stimulus to inspiration is chemical. 2. The vagus contains one set of fibers which is stimulated during normal inspiration by the distension of the lungs and which has an inhibitory action upon the inspiratory movements. 3. The vagus contains a second set of fibers which act upon the inspiratory center causing an inspiration. These fibers are stimulated by abnormal collapse of the lungs, that is only when the expirations are forced. 4. Thus the active respiratory movements are cut short by nervous action while those which are passive in character are self-limited.

No text-book tells the whole truth. Of course not. The pedagogic value of a text-book depends as much on what is left out as upon what is stated. This process of elimination may, however, be carried too far. The conception of the cerebral circulation presented by Leonard Hill some eight or ten years ago may be very simple and pleasant to teach, but to ignore all the work which has been done since then results in giving a very false impression to the student (see p. 279).

All text-books are more or less ultra-conservative. This may result in several sorts of defects.

1. *Lack of originality.* It is naturally difficult to be original in writing a text-book, but a wholesale copying of figures and demonstrations from other text-books should be avoided as far as possible. Where such copying is done without proper appreciation of the original author's meaning, the result is often a series of contradictions, such as the following: After the statement that the accelerators are without tone (p. 241), one reads "Thus, atropine paralyses the post-ganglionic fibers [of the vagus], thereby giving the accelerators full sway, the consequence being augmentation of the heart's beats" (p. 242). II. The theory of the heart beat (p. 230) has already been referred to (see above). Further on we read of the view of Engelmann and Gaskell and of the phenomena of Stokes-Adams disease, regarding which it is said "These facts favor the myogenic theory of cardiac contractions" (p. 232). It should of course be remembered that the auriculo-ventricular bundle contains nerve fibers so that its discovery has in no way settled the neuromyogenic controversy.

2. *The perpetuation of old errors.* In this connection I shall give an example which is found in almost all text-books, including the one under discussion (p. 272). The waves described by Traube (L. Traube: Centralblatt f. d. medicinischen Wissenschaften, 1885, p. 800; also Gesammte Abhandlung) and Hering (Ewald Hering: Wiener Sitzungsberichte, LX, 2, p. 829) were vasomotor waves synchronous with the respiration and probably due to irradiation from the respiratory to the vasomotor center. These waves are especially evident in anesthetized animals with open thorax during partial asphyxiation. The long waves which are not synchronous with the respiration but may be very much longer were described by Sigmund Mayer and should be called either Mayer's waves or simply waves of the third order (see L. Fredericq: Arch. f. (Anat. u.) Physiol., 1887, 351).

3. *The perpetuation of customs generally recognized as bad.* Indifference to the C. G. S. system is not usually to be met with

among scientists. It is therefore surprising to find that the book under discussion uses now one system and now another. This is probably due to the habit of borrowing passages from other books, a tendency which has been referred to under 1. Another custom, which is fortunately fast disappearing, is the incorporation into physiologic text-books of a considerable amount of anatomy and histology and sometimes (not however in the book in question) of other extraneous matter.

The objects of this review have been to point out certain difficulties and dangers which beset the writers of text-books of physiology and also, incidentally, to emphasize certain physiologic facts, which are generally overlooked. For the former the chapter on the circulation has proved a mine of illustrations. What errors and excellences the other chapters contain I cannot say, but I can state positively that any one reading the book may omit with profit the ninety-seven pages devoted to the circulation.

PERCY M. DAWSON.

Diseases of Infancy and Childhood: Their Dietetic, Hygienic, and Medical Treatment. By LOUIS FISCHER, M. D., Visiting Physician to the Willard Parker and Riverside Hospitals of New York City. Price $6.50. (*Philadelphia: F. A. Davis Company, Publishers, 1907.*)

It can hardly be said that there is need at present for another text-book covering the whole range of pediatrics, unless it contains features of special interest not adequately considered in similar books already accessible.

Dr. Fischer's book has more the character of a compilation of facts and opinions gathered at random from many sources than that of a uniformly authoritative treatise.

In the opening chapter on development and hygiene of the infant, one is surprised to find approval of the old treatment of inflamed gums by the use of laudanum in the middle ear. Abnormalities and diseases of the newly-born are rather completely catalogued in the next chapter and the more important ones discussed.

Apparently much effort was taken to make the chapter on feeding comprehensive. The newer chemical work on breast milk is outlined. The recent German literature on the subject has been freely drawn upon. Many authors are quoted at length. The method of presentation, however, does not give the impression of a well-considered, orderly résumé of the literature or even the more valuable results of personal experience. Certain exceptions must be taken to some of the statements in this portion. Proprietary preparations are rarely of service as galactagogues when simpler measures, such as milk, cocoa, and corn-meal mush, fail. The great service rendered infant feeding by the cereal gruels has received scant attention, and the top-milk feeding has proved itself too useful a method in many hands to be summarily dismissed. The practice of scalding the milk mixtures as recommended by Dr. Fischer is not necessary when milk of the highest standard is used and properly refrigerated, as in this manner of heating are brought about nearly all the changes produced by sterilization. The problem of feeding delicate children is not solved by the dextrinizing of the food as intimated on page 155. The author's experience with the Walker-Gordon Laboratory is unfortunate. Undoubtedly materials of first quality are offered to the profession at these laboratories. The success which attends their use depends largely on the kind of combinations ordered by the physician.

Apart from the question of feeding, one comes upon many surprising assertions. Considering the frequency of apthous stomatitis, the assumption that all cases are due to foot and mouth disease in the cows is quite unwarranted. The resort to surgery in cases of well-marked stenosis of the pylorus should not be delayed as a study of the pathology of the condition, which is not mentioned, indicates how little benefit may be hoped from palliative treatment.

Cyclic vomiting is too definite a symptom-complex to be cursorily dismissed.

The statement quoted from Park that the Shiga variety of dysentery "is present in all stools in New York City which contain mucus and blood" differs markedly from experience elsewhere. The more frequent organism in dysenteric stools in children belongs to the so-called Flexner type. The use of antidysenteric serum against this latter form of infection has not proved of much value.

The discussion of the congenital cardiac diseases is inadequate. The most frequent defect in these cases, namely, open auricular or ventricular septa, is hardly mentioned.

It is to be hoped that the advice to delay surgical intervention when there is reason to suspect pus in the abdominal cavity will not be followed, and that much reliance will not be placed in antistreptococcus serum in the treatment of tuberculous peritonitis.

The term, coli-cystitis, suggested in the book is apt to be misleading unless the spelling is noticed, and is, therefore, unfortunate.

The statement that scrofulosis will be the media through which later on tuberculosis develops, reminds one of the old fear that a bad cold might turn into consumption.

The most satisfactory portion of the work is that treating of the acute exanthematous diseases and of diphtheria. In this field Dr. Fischer's unusual experience gives him real authority. The discussion of laryngeal stenosis with the statistical account of the best methods of intubation is particularly full and valuable.

The concluding chapters on diseases of the nervous system, ear, eye, skin, and of the spine and joints, contain a brief résumé of the more important affections of these parts.

The book is concluded by a number of dietary and therapeutic suggestions, and by a short account of the methods for gastric and urinary analyses.

J. H. M. K.

Syphilis. A Treatise for Practitioners. By EDWARD L. KEYES, JR., M. D., Clinical Professor of Genito-Urinary Surgery, New York Polyclinic Medical School and Hospital, etc. (*New York and London: D. Appleton and Company, 1908.*)

It is a pity that a doctor who has had such a wide experience as Dr. Keyes in syphilis should not have written a better work, to which the term "pot-boiler" can be fairly applied. It is also a poor example of book-making. There is nothing new nor of value in this treatise, and the chapters are loosely strung together, and needless repetition is frequent. The proof-reading has been carelessly done and the author's English is not above par. There are many statements to which just exception may be taken. The morality of the following sentence can hardly be approved: "To prohibit matrimony in a given case may wreck a man's life more completely than syphilis could blast his wife's, and though this consideration can have no force in the first two years of the disease when infection is all but certain, in the fourth and fifth years one may make exceptions *for adequate social cause* [the italics are the reviewer's], and with due precautions, deeming the possibility of infection light in comparison to the certain despair implied by delay." As long as there is any possibility of infection marriage should be prevented as far as possible, in view of the fact that syphilis is perhaps the most horrible disease which prevails.

As mucous patches are one of the most common recurrences in this disease, and as they are the most virulent source of infection, it can hardly be true that "syphilis in the male ceases to be transmissible to wife or to child within five years in practically every instance, and under any circumstances of neglect and inefficient treatment."

On page 116, speaking of the diagnosis of syphilis the author says: "The only specific reaction at present available is the

Justus test," but a few lines below he adds "as it sometimes gives positive results in non-syphilitics, and negative findings even in actively syphilitic cases, it is of no clinical importance." If this is so the test should not be called "specific."

"*If the lesion does not yield to the usual doses, the way to a cure is not* through an increase in dose, etc." (p. 179). "In order to control a lesion otherwise unmanageable, insoluble injections may be given until the lesion begins to yield, etc." (p. 179). These two statements need to be reconciled.

It seems hardly justifiable to speak of embolism as a "petty inconvenience in comparison with the benefits sometimes to be derived from their use [insoluble injections]."

Why should "proprietary" ointment bases be recommended (p. 185) where other bases can equally well be used?

How is the air to be removed from the syringe in the following description? "Then fill the syringe with the solution to be employed, and note whether any blood is oozing from the needle; if so, change its location; if not, screw on the syringe, aspirate the minute bubble of air from the needle and inject the solution."

It does not seem likely that when inunctions are used much mercury can be inhaled from its evaporation from the surface of the body, and yet in a foot-note on page 187, it is stated "but it would seem that with the ordinary method of inunction, fully as much mercury is absorbed by the skin as is inhaled." Probably far more.

Although the author describes all the important methods of administering mercury, and mentions the "Intratracheal Injection" in large type, he gives no description of this method (p. 190).

"Chancroid, though probably more virulent, is less venereal, since it recognizes many methods of infection other than sexual congress" (p. 208). "Not once in a thousand cases does one see a chancroid except about the genitals. This is as much as to say that it is practically always acquired by sexual contact" (p. 209). Such carelessness in writing, such contradictions are inexcuseable.

It would be easy to add many more comparisons to prove how little attention has been given by the author to the production of this work, but it is not worth while. The book does not deserve more attention or note. A few of the misprints noted may be found on pages 156, 175, 179, 183, 342, 527. R. N.

Preliminary Nursing Technique for First-Year Pupil Nurses. By ISABEL MCISAAC, Late Superintendent of the Illinois Training School for Nurses, etc. (*New York: The Macmillan Company, 1907.*)

For the use of pupil nurses at the beginning of their training, this little book has been prepared by a teacher of nurses well-known for the excellence of her methods, who in it embodies the results of her many years of varied experience as the head of the largest training school in this country.

The book fulfills admirably its author's purpose in providing a simple manual which describes in detail the methods necessary to carry out efficiently the various procedures of nursing. The book is carefully written; the instructions are clear and concise. There is a good chapter on baths in which, in emphasizing the necessity of drill, the writer states that giving her first bath to a patient is like the first attempt to ride a bicycle or to skate, and that skill is only reached by repeated and painstaking efforts. In this chapter, however, one is constrained to note, and to question the necessity for, the following statement: "The water should never be used a second time, nor for another patient."

In the chapter on the administration of medicines, one finds the excellent suggestion that a small book giving dosages, and antidotes to poisons, be kept in every hospital medicine closet.

The book, though small, is quite comprehensive and eminently practical and reliable, and should prove a safe guide for young nurses.

Hematological Atlas, with a Description of the Technic of Blood Examinations. By PRIV. DOZ. DR. KARL SCHLEIP, Scientific Assistant in the Medical Clinic University of Freiburg i/B. English Adaptation of Text by FREDERIC E. SONDERN, M. D., Professor of Clinical Pathology New York Post-Graduate Medical School and Hospital. With 71 colored illustrations. Price $10. (*New York: Rebman Company.*)

This volume presents a collection of lithographic plates of the blood in normal and pathological conditions with a brief descriptive text, including also directions for making blood examinations.

The plates are for the greater part excellent, with here and there only a fault in registration.

They have the limitation that they are made from preparations with Romanowsky stain and have all the faults incident to this method, especially in reference to granular differentiation. They are slightly diagrammatic in that they portray a sharpness of granular stain rarely obtained by any Romanowsky process.

The plates of the anæmias and leukæmias are excellent as pictures with the eosin-azure methylene-blue stain.

The plates of malarial infections and trypanosomiasis are not up to the average standard of excellence in the rest of the work.

Auscultation and Percussion, together with other methods of physical examination of the chest. By SAMUEL GEE, M. D., etc. Fifth edition. Price $1.50. (*New York and London: Oxford University Press, 1907.*)

For a thorough knowledge of the signs of disease, the first essential is a clear understanding of the principle upon which are based the methods of investigation. It is too often the case that, in text-books on physical diagnosis, lengthy descriptions are given of the changes which occur in disease, without endeavoring to make clear on what physical laws the alterations are dependent. As the author states in his introductory note, the first part of the volume under review "treats of physical signs in the abstract—the pure science of physical signs." A lucid account is given of the theory of auscultation and percussion, without a grasp of which their application is of little value. The second part, which deals with physical signs as altered by disease, contains little that is new. It is, however, written in an original and pleasing manner, and cannot fail to attract the attention of both teacher and student. It is seldom that one reads a work of this kind which is written in a more refreshing and dignified style. This little book can be recommended not only to the medical student, who is studying physical diagnosis for the first time, but also to the general practitioner. H. A. S.

Heart Disease and Thoracic Aneurysm. By F. I. POYNTON, M. D., Lond.; F. R. C. P., Lond., etc. Price, $1.50. (*New York and London: Oxford University Press, 1907.*)

The object of this manual is to give an outline of the more important cardiac affections. No attempt is made to enter into the subject in detail, as such would be impossible within the scope of the book; still, one is struck with the large accumulation of facts which have been collected into so small a compass.

In its general arrangement, the book differs from others bearing on the same subject in that rheumatic affections of the heart are taken as type of cardiac lesions. As in many works, however, which are of the nature of a "multum in parvo," a somewhat dogmatic attitude is adopted. In many respects the author has made the book well abreast of the recent advances in the study of cardiac affections. The chapter on the neuromuscular diseases is an excellent summary of our knowledge up to date. In two respects the book may be adversely criticised. Too little attention is given to the functional disorders of the circulation and the means by which they are diagnosed, viz., cardiographic methods. A more typical venous tracing might well be substituted for that which is reproduced from Gibson and Russel's manual. No mention is made of the altered rhythm which may

appear in myocarditis, especially that form associated with chronic nephritis. The presystolic gallop rhythm is now recognized as one of the most marked features of this condition. An expanded index would be an improvement. H. A. S.

Modern Clinical Medicine. Diseases of the Nervous System. Edited by ARCHIBALD CHURCH, M. D. Translated by JULIUS L. SALINGER, M. D. Price $7 net. (*New York and London: D. Appleton & Co., 1908.*)

Doubtless most of our readers are familiar with the series of which this volume is one, and which are translations of "Die Deutsche Klinik." The present volume contains thirty-two chapters or sections by almost as many writers. Naturally we find an author associated with the subject to which he has given most attention or with which we are apt to associate him on account of the fame he has gained in connection with it. For example, we find Lumbar Puncture by Quincke, The Symptom-complex of Aphasia by Wernicke, and Hysteria by Ziehen. With such a plan we naturally expect to find that each subject is treated in a masterly manner and to have a feeling that what we read is the opinion of an expert on the subject. Usually this is the case but sometimes not, as in Quincke's article on Lumbar Puncture, which is considerably behind the times and, in regard to cytological findings, is practically valueless. There is so much that is good in the article that this seems strange, until on examination of the literature appended we find no later reference than 1902, which was probably the year that Quincke wrote the article, and in criticising it we must judge it from a standard of at least five years ago. Of the editor, however, our criticism may perhaps be more severe, as he has failed in his duty of bringing the work up to date. Of the section upon Tabes Dorsalis by Erb, we find on the other hand but little to criticise, and the subject is adequately disposed of.

In so large a book as this, 1160 pages exclusive of the indexes, it is possible to find much to criticise, but there is much more to commend, and we believe it to be a valuable work for those who do not have the opportunity to become familiar with the most recent literature, and to those who find German difficult the book will be especially valuable. Mechanically, the book is attractive and the illustrations are all very good. W. R. D.

Chemical Pathology: Being a Discussion of General Pathology from the Standpoint of the Chemical Processes Involved. By H. GIDEON WELLS, PH. D., M.D., Assistant Professor of Pathology in the University of Chicago and in Rush Medical College, Chicago. 549 pages. (*Philadelphia and London: W. B. Saunders Company, 1907.*)

Various works on chemical pathology have appeared from time to time in which selected topics have received treatment, but so far as the reviewer is aware this is the first "Discussion of General Pathology from the Standpoint of the Chemical Processes Involved."

The subject-matter of the book is divided into the following chapters: Chemistry of the Cell; Enzymes; Bacteria and their Products; Animal Parasites; Immunity; Chemical Means of Defence against Poisons of Known Composition; Phytotoxins and Zootoxins; Hemolysis and Cytotoxins; Inflammation; Diseases of the Circulation and of the Blood; Edema; Retrogressive Processes; Calcification, Concretions, and Incrustations; Pathological Pigmentation; Tumors; Metabolism and Autointoxication; The Ductless Glands; Uric Acid Metabolism and Gout; Diabetes. These important subjects are treated in a most interesting manner and apparently nothing of great importance in the literature has been overlooked, which testifies to the wide reading of the author. The style is clear and concise and the well-selected references to the literature will enable those who want to go deeper into the subject to find the literature on any particular topic. The author is to be congratulated on the excellent result of his arduous labor.

The author states that the first three chapters are for the benefit of those who are unacquainted with the modern developments of physiological chemistry. It is to be hoped that in subsequent editions these may be omitted because of the complete recognition of the fundamental importance of physiological chemistry for medicine. Biological chemistry has had a severe struggle for proper recognition in America and even now it is not accorded equal rank with anatomy, physiology, pharmacology, and pathology in many of our greatest universities. The appearance of Dr. Well's book on the pathological branch of the subject may be taken as a hopeful sign that the medical profession is coming to a realization of the importance of biological chemistry and that it will soon be granted the position and dignity among the medical sciences which it deserves. A. S. LOEVENHART.

Psychology Applied to Medicine. Introductory Studies. By DAVID W. WELLS, M. D. $1.50 net. (*Philadelphia: F. A. Davis Company, 1907.*)

This little book of 141 pages is divided into nine chapters, entitled Reason and Instinct, Habit, Sensation, Experimental Psychology, Hypnosis-Historical, Hypnosis-Phenomena, Hypnosis-Theories, Psychotherapeutics, and Psychic Element in Medicine. The author presents his subject in a very elementary way and also very entertainingly, using poetry or interesting stories to illustrate when he so desires, and this point of making his book very readable constitutes its chief charm. Its chief defect is that it is so elementary, but as it was written especially for the author's class in the Boston University Medical School, a homeopathic institution, he has probably done wisely in not attempting to force too much of a subject generally regarded as dry upon a group of students.

The book is attractively bound and printed and the illustrations are good. W. R. D.

Modern Otology. By JOHN F. BARNHILL, M. D., Professor of Otology, Laryngology, and Rhinology, Indiana University School of Medicine, and ERNEST DEWOLFE WALES, B. S., M. D., Associate Professor of Otology, Laryngology, and Rhinology, Indiana University School of Medicine. 305 illustrations, many in colors. Price $5.50. (*Philadelphia and London: W. B. Saunders Company.*)

The preface to this book states that the authors had in mind, during its preparation, the following special objects: To modernize the subject, correct certain traditional beliefs, advocate the earliest possible treatment, emphasize the importance of thorough examinations and definite diagnoses, and, to thoroughly illustrate the text. All worthy objects but not all attained in even a satisfactory degree. In the least important ones they did fairly well. In the matter of illustrations they succeeded admirably; indeed, I think it is the best illustrated text-book on otology that has ever been published. The specimens and preparations have been well selected, the drawings were well conceived and beautifully executed, and their reproduction is fine.

In the matter of modernizing the subject of otology, however, I fear they have failed. In the first place it is a pity that they not only have adhered to but exaggerated the old plan of chapter divisions. For instance, chronic purulent otitis media, though only covering 43 pages, is divided into three chapters; the intracranial complications of this disease occupies seven chapters, though it is all expressed within 60 pages; chronic non-suppurative otitis media requires three chapters. Add to this faulty subdivision of topics the fact that they have not maintained a proper sequence in treating of the suppurative and non-suppurative diseases, and one sees that they have converted what should be a simple, connected story into one that is broken, complicated,

and difficult to understand. If modern pathology has taught the otologist anything it is that acute tubo-tympanal catarrh, acute catarrhal otitis media, and chronic catarrhal otitis media are not different diseases but, merely, varying degrees or stages of the same affection. The same is true of the purulent affections of the tympanic cavity and mastoid cells.

In the modern text-book on any medical branch pathology should be the strong point. In this book the pathology is lamentably weak.

The strongest point in the work seems to me to be the attention paid to all the little details of clinical study and care of cases. In this respect alone the book is worth its price to the ear specialist. It represents the individual experience of the writers to a large degree, which gives it a peculiar value, and the beginner in otologic work will be perfectly safe in following the recommendations. I would not agree with the writers regarding the value of all their methods of treatment, perhaps, but will at least admit that our different points of view are debatable. Dr. Barnhill has not been so liberal. His condemnation of the blood-clot dressing in the mastoid operation is most unfair. In a brief foot-note he mentions that Blake, Reik, and Sprague advocate the method, expresses his feeling that the mastoid wound cannot be rendered sterile, and, quotes Dr. Jack to show that the method will usually fail or at best succeeds in only four out of 60 cases (6⅔%). Now the fact that he mentions the advocacy of the three first-named aurists in connection with Jack's paper shows that he must have been familiar with the statistics of Reik and Sprague, as well as those of Jack, for they were published in the same volume of Transactions of the American Otological Society, on consecutive pages, and all were discussed together. He employs the figures that condemn the method and ignores those of other workers which show from 50% to 75% of successes. I do not object to his attitude of disbelief in the dressing. He is at perfect liberty to adhere to the old method, even to bring forth any argument he can to prove that it is unworthy of trial, but, we ask for a fair and square presentation of all the facts in hand. H. O. R.

Milk and its Relation to the Public Health. By various authors. Hygienic Laboratory Bulletin No. 41. Treasury Department: Public Health and Marine Hospital Service of the United States. (*Washington: Government Printing Office, 1908.*)

This most important bulletin should reach every board of health in the United States; and much of the information contained in it would be of great value to the public, if this body could be reached in some effective manner. It will be only through the education of the people, and through their resulting forceful demands that our cities will receive little by little pure supplies of milk, and that the needless death and illness of numberless infants will be prevented. Could mothers see for themselves, and learn of the filthy conditions which prevail far and wide in our sources of milk supply, it would not be long before a distinctly improved condition in this matter resulted. There is no other food used by man which he takes with so little consideration as to its purity, and which is commonly so foul and disgusting. It is impossible to speak too strongly on this point. The government at Washington would have accomplished an end of far greater value if it had directed its attention and energies to "purity of milk," rather than to purity of other foods, whose impurities probably cause but infinitesimal suffering and a minimal proportion of deaths to that caused by milk. The "pure-food" law is admirable in many respects, but its value as regards national health and welfare is not to be measured in comparison to the beneficial effects to be reached from a "pure-milk" supply. It is therefore most fortunate that the Public Health and Marine Hospital Service of the United States should have issued this comprehensive volume which treats of milk in its relation to public health in a masterly manner. Here the subject is divided into twenty-two headings, and the bulletin begins with a discussion of milk as a cause of epidemics; after reading this chapter no one can longer doubt the immense rôle that this food plays in the spread of typhoid fever, scarlet fever, and diphtheria. The accompanying charts are most instructive. Other chapters of interest are those of "the frequency of tubercle bacilli in the market-milk of Washington, D. C.; morbidity and mortality statistics as influenced by milk; ice-cream; the chemistry of milk; diseases of the cow which injuriously affect the milk; and sanitary inspection of farms, and sanitary water supplies for the dairies." It is the publication of just such a report as this one which makes the existence of this service of the Treasury Department of such vital importance to the nation, and which does great credit to the authors of the various papers. It is to be hoped that the service will soon be separated from the Treasury Department, and that we shall have a "Secretary of Public Health." R. N.

Progressive Medicine. Edited by Hobart Amory Hare, M. D., etc., assisted by H. R. M. Landis, M. D., etc. Vol. I, March, 1908. Surgery of the Head, Neck, and Thorax; Infectious Diseases, including Acute Rheumatism and Croupous Pneumonia; The Diseases of Children; Rhinology and Laryngology; Otology. (*Philadelphia and New York: Lea & Febiger, 1908.*)

The quarterly publication of this work makes it only necessary to note the regular appearance of the volumes with their contents. They are not fitted to reviews, as they are themselves but condensed reviews of the literature of the past few months on the subjects treated. Both contributors and editors appear to labor conscientiously at their rather thankless and wearisome task of compilation, but their results are doubtless useful to many busy practitioners, who must be silently grateful for these volumes. R. N.

Bulletin of the Toronto Hospital for the Insane. A journal devoted to the interests of Psychiatry in Ontario. Printed by order of the Legislative Assembly, January, 1908. (*Toronto: Warwick Brothers & Rutter, Limited, 1908.*)

This bulletin is mainly filled with an account of the psychiatric clinics of Germany from the pen of Dr. C. K. Clarke, who lately visited them as a representative of the Province of Ontario. He visited several of the German psychiatric clinics and gives an interesting résumé of the advantages and disadvantages of the principal ones, Berlin, Munich, Tübingen, and Giessen. The author gives the preference to the clinic at Munich, both as regards the arrangement of the buildings and the methods of treatment employed there. We would commend this paper to the careful consideration of all who are engaged in the hospital treatment of the insane. It is most valuable and suggestive.

Light and X-Ray Treatment of Skin Diseases. By Malcolm Morris, F. R. C. S., and S. Ernest Dore, M. D. Price $1.50. (*Chicago: W. T. Keener & Co., 1907.*)

Morris and Dore have not intended their book to be an exhaustive study on light treatment. It is more a monograph and gives largely their experiences and cases treated in this line of work. On reading the book one cannot but be impressed by the sane and conservative way in which the authors treat the subject. There can be no doubt that they are convinced that the light treatment in skin diseases, especially lupus, is far superior to other forms of treatment, yet they frankly point out its limitations and confess that a certain percentage of cases do not yield at all.

So much has been claimed for light treatment and constantly we see in our medical journals impossible cures made by the

X-ray, Finsen, or radium treatment that it is a relief to find a monograph which gives an honest view of the subject. The authors have given us a concise summary of the methods of application and the results of the Finsen light treatment, X-ray, and radium. Their hospital connections have given them a large amount of material and so they are in a position to speak authoritatively on the subject.

Outlines of Psychiatry. Nervous and Mental Disease Monograph Series No. I. By WILLIAM A. WHITE, M. D., Superintendent Government Hospital for the Insane, Washington, D. C., etc. (*New York: The Journal of Nervous and Mental Disease Publishing Company, 1907.*)

This work gives an excellent outline of modern psychiatry and is worthy the attention of all students of mental medicine. The author does not consider insanity a single disease but rather a series of disorders of some or all of the mental processes. His definition of insanity is a time-honored one and probably as serviceable as any which can be given to the student. "Insanity is a disorder of the mind due to disease of the brain manifesting itself by a more or less prolonged departure from the individual's usual manner of thinking, feeling, and acting, and resulting in a lessened capacity for adaptation to the environment."

The chapters on classification and causation contain nothing especially new or interesting and do not require special consideration. A general chapter on treatment follows, although specific directions for the treatment of the various forms of insanity are also given in subsequent chapters. We notice that he prefers the œsophageal to the nasal route in feeding contrary to the experience of many. The section also on medication is open to the objection that it seems to give too much countenance to the administration of hypnotics and the hypodermic use of the alkaloids of hyoscyamus. The general practitioner is too much inclined to rely upon these remedies and does not generally, like the author, defer their use "until other means have failed." The author's description of the general symptomatology of insanity is excellent and his definitions of terms like illusions, hallucinations, clouding of consciousness, dream states, stereotypy, negativism, disorders of personality, etc., are very clear and well-expressed. The chapter upon the examination of the insane is one of the most complete in the whole book. It is so full in fact that one almost questions the possibility of making practical use of it in a large institution with many admissions. Some of the tests proposed seem better adapted to normal rather than abnormal psychology. The chapter on Paranoia and Paranoid States is carefully and discriminatingly written and deserves attention. We have rarely seen a more satisfactory exposition of these much-controverted topics. The same is true also of the chapters entitled Manic Depressive Psychoses, Dementia Precox, The Infection and Exhaustion Psychoses, and the Toxic Psychoses. We notice in the latter that the author recommends the gradual withdrawal of morphia from the morphia habitué. This seems wise only where there is great physical debility. In many cases the peremptory withdrawal of the drug contributes to the permanency of the recovery by showing the habitué that he suffers much less than he expected and gives him confidence in his own strength of will. The book is so well done it deserves to be introduced into medical schools and training schools for nurses. We shall hope to see a more elaborate work on insanity from the author.

BOOKS RECEIVED.

The Animal Mind. A Text-book of Comparative Psychology. By Margaret Floy Washburn, Ph. D. The Animal Behavior Series. Volume II. 1908. 12mo. 333 pages. The Macmillan Company, New York.

Hematological Atlas, with a Description of the Technic of Blood Examination. By Priv. Doz. Karl Schleip. English Adaptation of Text by Frederic E. Sondern, M. D. With 71 colored illustrations. [1908.] 4to. 256 pages. Rebman Company, New York.

Progressive Medicine. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M. D., assisted by H. R. M. Landis, M. D. Volume I. March, 1908. 8vo. 284 pages. Lea and Febiger, Philadelphia and New York.

Rotunda Midwifery for Nurses and Midwives. By G. T. Wrench, M. D. With Introduction by the Master of the Rotunda Hospital. 1908. 12mo. 324 pages. Henry Frowde, London; Hodder and Stoughton, London. *Oxford Medical Publications.*

Scientific Memoirs (New Series), No. 29 and 30. By Officers of the Medical and Sanitary Departments of the Government of India.

Piroplasma Canis and its Life Cycle in the Tick. By Captain S. R. Christophers, M. B., I. M. S. 1907. Fol. 83 pages. Office of the Superintendent of Government Printing, Calcutta, India.

The Theory and Practice of Anti-Rabic Immunization. By Captain W. F. Harvey, M. B., I. M. S., and Captain Anderson McKendrick, M. B., I. M. S. 1907. Fol. 43 pages. Superintendent of Government Printing, Calcutta, India.

Treatment of Internal Diseases. By Dr. Norbert Ortner. Edited by Nathaniel Bowditch Potter, M. D. Translated by Frederic H. Bartlett, M. D. From the fourth German edition. [1908.] 8vo. 658 pages. J. B. Lippincott Company, Philadelphia and London.

Life Insurance and General Practice. By E. M. Brockbank, M. D. (Vict.), F. R. C. P. 1908. 12mo. 288 pages. Henry Frowde, London; Hodder and Stoughton, London. *Oxford Medical Publications.*

Medical Lectures and Aphorisms. By Samuel Gee, M. D. 1908. 12 mo. 288 pages. Henry Frowde, London; Hodder and Stoughton, London. *Oxford Medical Publications.*

Clinical Lectures and Addresses on Surgery. By C. B. Lockwood. 1907. 12mo. 307 pages. Henry Frowde, London; Hodder and Stoughton, London. *Oxford Medical Publications.*

Manual of Surgery. By Alexis Thomson, F. R. C. S. Ed., and Alexander Miles, F. R. C. S. Ed. Second edition, revised and enlarged. With 516 illustrations, mostly wood engravings. Volume first, General Surgery. Volume second, Regional Surgery. 12mo. [1906.] J. B. Lippincott Company, Philadelphia and London.

Saint Bartholomew's Hospital Reports. Edited by H. Morley Fletcher, M. D., and W. McAdam Eccles, M. S., F. R. C. S. Volume XLIII, 1907. 8vo. 439 pages. 1908. Smith, Elder, and Company, London.

A Practical Guide to the Examination of the Ear. By Selden Spencer, A. B., M. D. With an Introductory Chapter by H. N. Spencer, M. D., LL. D. 1908. 12mo. 66 pages. C. V. Mosby, Medical Book Publishing Company, St. Louis.

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